A STUDY OF SCHOOL-BASED MENTORING: AN EXAMINATION OF SUPPORTED VERSUS NONSUPPORTED MENTORS ON MENTOR EFFECTIVENESS AND EARLY CAREER TEACHER OUTCOMES

by

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Abstract

The purpose of this dissertation was two-fold: (1) to examine the relationship between receiving mentoring supports and mentor effectiveness to ECTs' outcomes including retention, satisfaction, and Instructional Framework ratings and (2) to examine the relationship between mentor supports (i.e. release time, mentor training, and mentor professional development) on mentor activity, mentor effectiveness, and ECTs' outcomes. Seventy-three early career teachers (ECT) in a mid-Atlantic urban school district rated their mentors' effectiveness (n = 35) on the Mentor Standards Rating Instrument (MSRI). The MSRI was developed and tested for validity and reliability as part of this dissertation. Teacher effectiveness rating data, and self-reported career plans were collected on ECTs. Mentors self-reported the type and frequency of supports they accessed (i.e. mentor professional development; district mentors; support from administration and academic content liaisons (ACLs); collaboration with alternative certification programs; use of video feedback, etc.). A composite mentor support variable was created and propensity scores were calculated to determine if there was a difference in mentor effectiveness, ECT outcomes, and mentor activity (i.e. mentor work log) for Supported versus Nonsupported mentors. Multivariate regression analyses showed no significant findings. Post hoc univariate analyses ($p < .10$) indicated minimal negative relationships between mentors accessing administrative support and mentors accessing ACL support and percent change in the MSRI-Instructional Practice. A minimal positive relationship was found between mentors accessing support from alternative certification programs and percent change in MSRI-Feedback.

This dissertation has implications for further induction research with a primary focus on mentoring and mentoring supports on ECT outcomes.

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John Dewey (1897) stated “Education is not preparation for life; education is life itself”. Throughout my own education and career as a teacher and educational researcher, I have strived to emulate this quotation. My educational career started as a four year old at St. Francis Xavier School. After graduating from my high school, Merion Mercy Academy, I transitioned to Johns Hopkins University where I earned my undergraduate and graduate degrees. Throughout this 30 year span, I was fortunate to have wonderful teachers with varied pedagogical styles, content expertise, and life experiences. From them I learned how to be a critical thinker who asked questions and who was very rarely satisfied with the answers. They taught me how to find the answers which ultimately led to more questions and more study. My teachers also taught me how to articulate and defend my position while being humble enough to understand that I do not always know the answer.

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Chapter 1: Introduction

Background

In a 2008 address to the 80th Convention of the American Federation of Teachers, then presidential candidate Barack Obama stated "[It] begins with recognizing that the single most important factor in determining a child's achievement is not the color of their skin or where they come from; it's not who their parents are or how much money they make. It's who their teacher is" (Obama, 2008). Within the current landscape of education reform policy, the role of teacher has been highlighted as key to minimizing the achievement gap (U.S. Department of Education, 2010). Questions surrounding how teachers should be prepared, what teachers should teach, and how they should teach it are of constant debate and the focus of much research and many policy initiatives. Understanding the nuances and intricacies of the relationship between teacher and student achievement is an overwhelming and daunting prospect. Both research and policy alike have focused on high quality and highly effective teachers as the panacea to close the achievement gap. However, it is difficult to clearly identify what makes a teacher high quality or highly effective.

In *The Flat World and Education: How America's Commitment to Equity Will Determine Our Future,* Darling-Hammond (2010) identified the importance of a teacher's academic background, preparation, certification status, and experience on student achievement. Furthermore, Darling-Hammond acknowledged that students in high minority and low-income schools are more likely than their white higher income counterparts to be taught by teachers who are less prepared, under credentialed and less experienced. This coupled with the high turnover of new teachers in minority and low income schools leads to a cumulative effect of being taught

by a steady stream of inexperienced and underprepared teachers which further exacerbates the achievement gap (Darling-Hammond).

To address the need for improved teacher preparation and retention, there has been an emphasis on different policy initiatives including incentive pay and professional development. Additionally, a great deal of focus has been placed on the induction of new teachers. Ingersoll and Strong (2011) have provided a framework for the induction of ECTs. According to their framework, the purpose of teacher induction programs is to provide support for teachers in order to improve teaching efficacy and retention through "support, guidance, and orientation programs" (p. 203) for new teachers. These may include pre-service internships, in-service professional development, collaborative planning, reduced workload and mentoring (Ingersoll & Strong).

For the purpose of this dissertation I will focus on one aspect of the new teacher induction program: mentoring of in-service teachers. Mentoring is an important component of induction programs (Hobson, Ashby, Malderez, & Tomlinson, 2009; Ingersoll & Strong (2011); Strong, 2009). In fact, mentoring and induction are often used interchangeably (Ingersoll & Smith, 2004; Long, McKenzie-Robblee, Schaefer, Steeves, Wnuk, Pinnegar, & Clandini, 2012). However, Nielsen, Barry, and Addison (2006) delineated between mentoring and induction by defining induction as a period of time in which ECTs receive comprehensive supports to introduce them to the teaching profession. Conversely, they defined mentoring as a component of induction programs in which experienced teachers provide support for early careers teachers (Nielsen, Barry, & Addison). The prevalence of induction programs has steadily increased from 40% of first year teachers reporting participation in 1990 to almost 80% in 2008 (Ingersoll & Strong). With this increase in induction programs came an increase in research to determine the

effectiveness of induction and its components, including mentoring (Ingersoll & Strong). However, the effects of induction and specifically mentoring are unclear (Ingersoll & Strong).

Problem

Many states have adopted mentoring as a core component of their induction programs for ECTs (Evertson & Smithey, 2000). However, it is not clearly defined who mentors are, what mentors should do to best support teachers, how mentors should be trained and developed professionally, and how mentors should be compensated (Evertson & Smithey; Ingersoll & Strong). In most instances, mentoring is an unfunded mandate that is often not clearly defined by states (Stanulis & Floden, 2009) with little consideration given to whether or not mentors know how to adequately coach and guide the practice of their ECTs (Feiman-Nemser & Carver, 2012). Although the research is not clear, studies have suggested that mentoring can have positive effects on ECTs' perceptions and induction experiences (Feiman-Nemser & Carver). Moreover, mentoring is thought to be more successful in improving ECT outcomes when there is proximity in grade level/content between the mentor and mentee, designated time allocated for mentoring, selection of mentors, and a high quality of mentoring (Evertson & Smithey; Feiman-Nemser & Carver). However, the scope, intensity, duration, and type of mentoring supports offered can vary dramatically across and even within programs. This coupled with different levels of fidelity of implementation can make it difficult to study the effects of mentoring programs specifically and induction programs more generally (Ingersoll & Strong).

A critical review of the induction literature by Ingersoll and Strong (2011) identified 15 studies that indicated that participation in induction programs were inconsistently related to increases in teacher retention, changes in classroom practice, and improvements in student achievement. Due to the programmatic issues and the dearth of existing rigorous research, in

conjunction with the increased importance of and emphasis on induction programs as they are related to teacher retention, effectiveness and ultimately student achievement, it is important to more closely study the relationship between comprehensive induction supports which Smith and Ingersoll (2004) identified as mentoring, new teacher orientation, sustained professional development, and opportunities to connect with other ECTs and outcomes to determine what works (Ingersoll & Strong). Moreover, it is essential to examine the different components of induction supports to determine what the relationship of individual components is to outcomes of interest. Due to the inconsistencies in research findings and lack of research focus on the effectiveness of specific induction supports, additional research is needed. One key piece of this induction research is to examine the relationship between mentoring supports, mentor effectiveness and ECT outcomes.

This dissertation study will focus on a specific component of the induction program: mentoring supports in a large urban district for ECTs. The purpose of this dissertation will be two-fold. This dissertation will:

1. Examine the relationship between receiving mentoring supports and mentor effectiveness to ECTs' outcomes including retention, satisfaction, and Instructional Framework ratings.
2. Examine the relationship between mentor supports (i.e. release time, mentor training, and mentor professional development) on mentor activity, mentor effectiveness, and ECTs' outcomes.

Outline of Study

Elizabeth City[1] Public Schools (Elizabeth City Schools) is a large urban district in a mid-size Mid-Atlantic state that employees 6,000 teachers in 200+ schools. Approximately 1,300 are teachers in their 1st through 3rd years. To support its ECTs[2], Elizabeth Schools has adopted a comprehensive induction program (see Figure 1) which includes a new teacher orientation, new teacher specific professional development series, content specific professional development courses, support from content specialists and school-based mentoring.

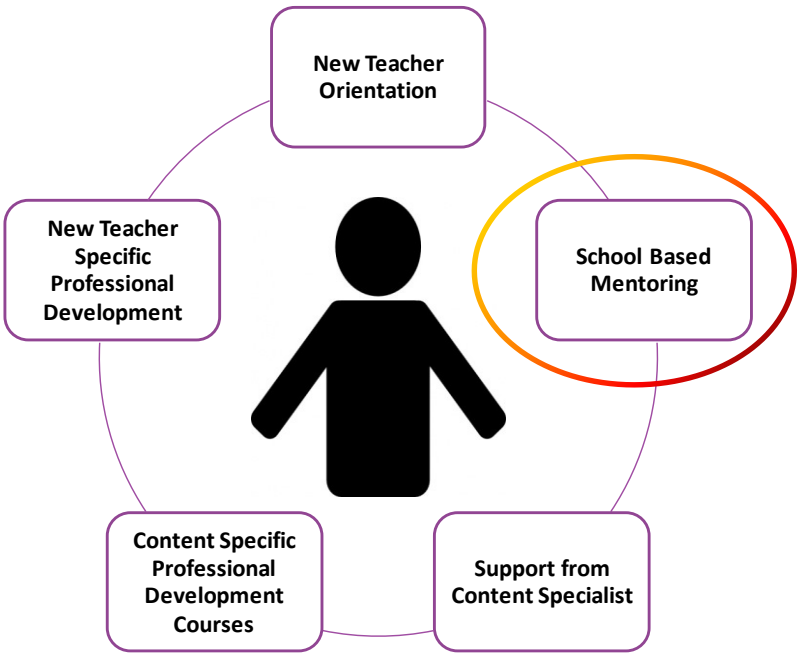

Figure 1. Elizabeth City Schools comprehensive induction program.

The school-based mentoring component has been designed to provide support for Elizabeth City Schools' ECTs in compliance with district policy and state regulations which require local education agencies (LEAs) to "establish and maintain a comprehensive Induction Program throughout their probationary period. This includes mentoring, pre-service institutes, and

[1] Elizabeth City Public Schools is a pseudonym.
[2] Early Career teachers refer to teachers in their 1st through 3rd years in Elizabeth City Schools.

ongoing professional development" COMAR 13.A.07.01 Comprehensive Teacher Induction Program; Education Article, §§2-205(c), 5-206-1, and 6-202(b), Annotated Code of Maryland.

Organization of school-based mentoring program.

Elizabeth City Schools' is a decentralized district. As such, school based administrators select school-based mentors and submit their names to the Coordinator of District Mentoring. School-based administrators have discretion as to what position, roles, and other responsibilities the school-based mentor has. Consequently a school-based mentor can be a full release mentor, instructional support personnel, or a full time classroom teacher. The organization of the School-Based Mentoring Program is shown in Figure 2. A Coordinator manages three District Mentors who provide support to school-based mentors who in turn support ECTs.

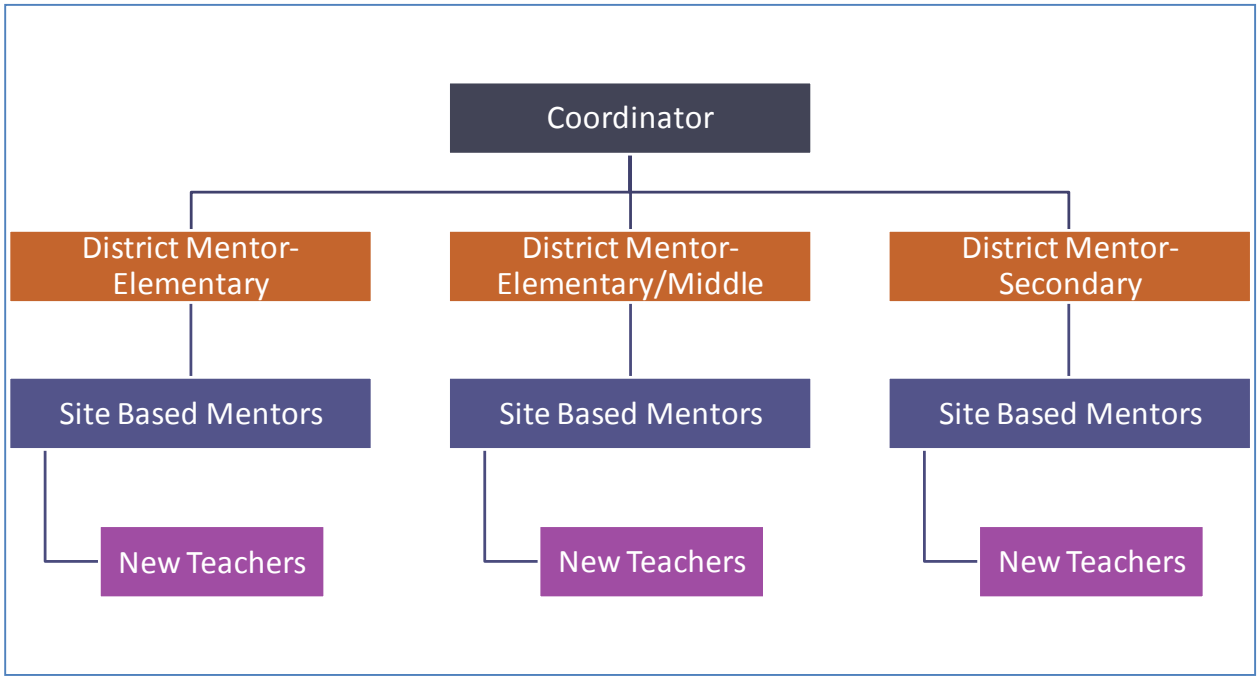

Figure 2. School-based mentoring organization chart for Elizabeth City Schools

Elizabeth City Schools has adopted a Mentoring Cycle of Development (see Figure 3) which school-based mentors are encouraged to use with their ECTs. Aligned with this

Mentoring Cycle of Development, the roles and responsibilities of school based mentors are outlined in the district's *Mentor Teacher Handbook:*

- "Engage, support, and advance the professional learning of teachers in the theory, pedagogy, and application of new instructional and management strategies.
- Utilize instructive, collaborative, and facilitative strategies to model and provide evidence-based feedback to new teachers on the implementation of strategies that promote learning and development.
- Develop a teachers' ability to self-monitor and assess practice and monitoring professional goals based on teaching standards and analyzing feedback to improve instruction.
- Establish opportunities for teachers to present, share, and problem solve with peers and leaders.
- Provide targeted, evidence-based feedback at each stage of the cycle of development"

(Elizabeth City Schools, Office of Teacher Support & Development, 2012).

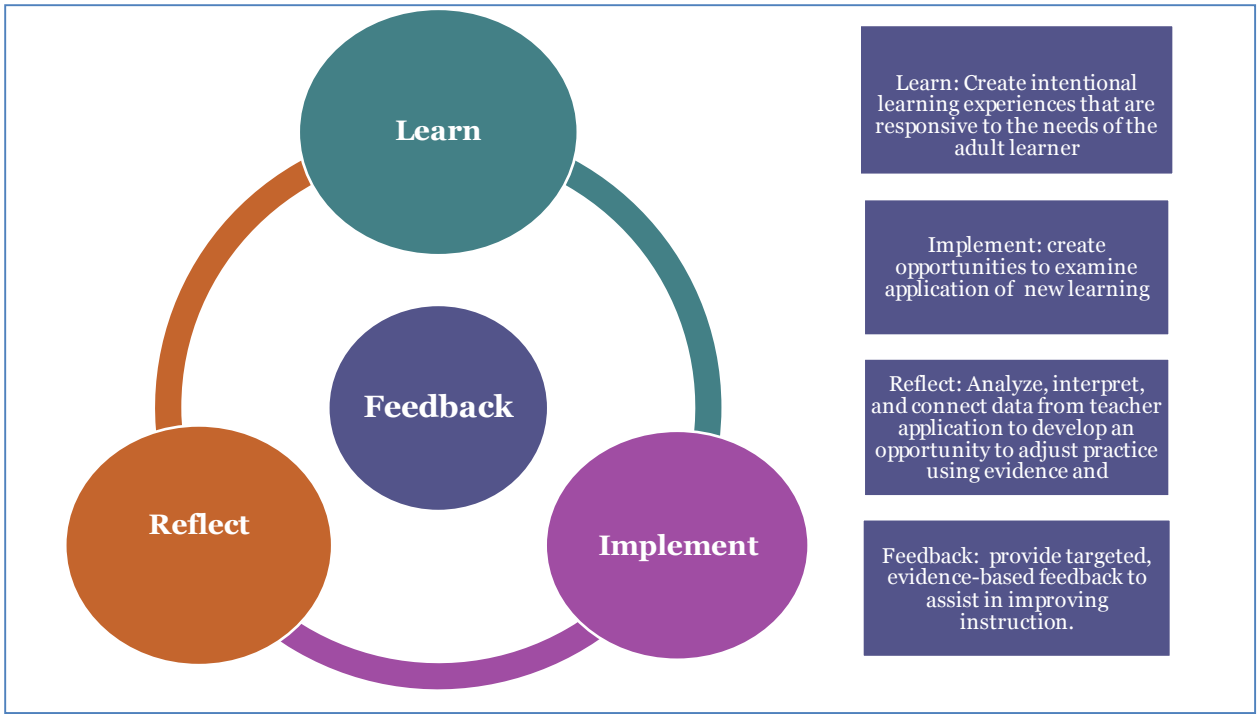

Figure 3. Elizabeth City Schools Mentoring Cycle of Development (Office of Teacher Support & Development, 2011)

In addition to training through an optional week long summer Mentor Academy which introduces the Mentoring Cycle of Development, Mentor's Roles and Responsibilities, and Mentor Standards (see Table 1); additional optional supports are available to school-based mentors throughout the school year (see Figure 4). School-based mentors can attend monthly or bimonthly mentor specific professional development, receive varying levels of support from the District Mentors, and depending on their school-based administrators' discretion may have release time or a reduced workload to work exclusively with ECTs. These supports are consistent with the research of Darling-Hammond, who found that ECTs' "practice is enhanced further when their mentors also receive formal training and have release time to provide one-to-one observation and coaching in the classroom, demonstrating effective methods and helping them solve immediate problems of practice" (p. 218).

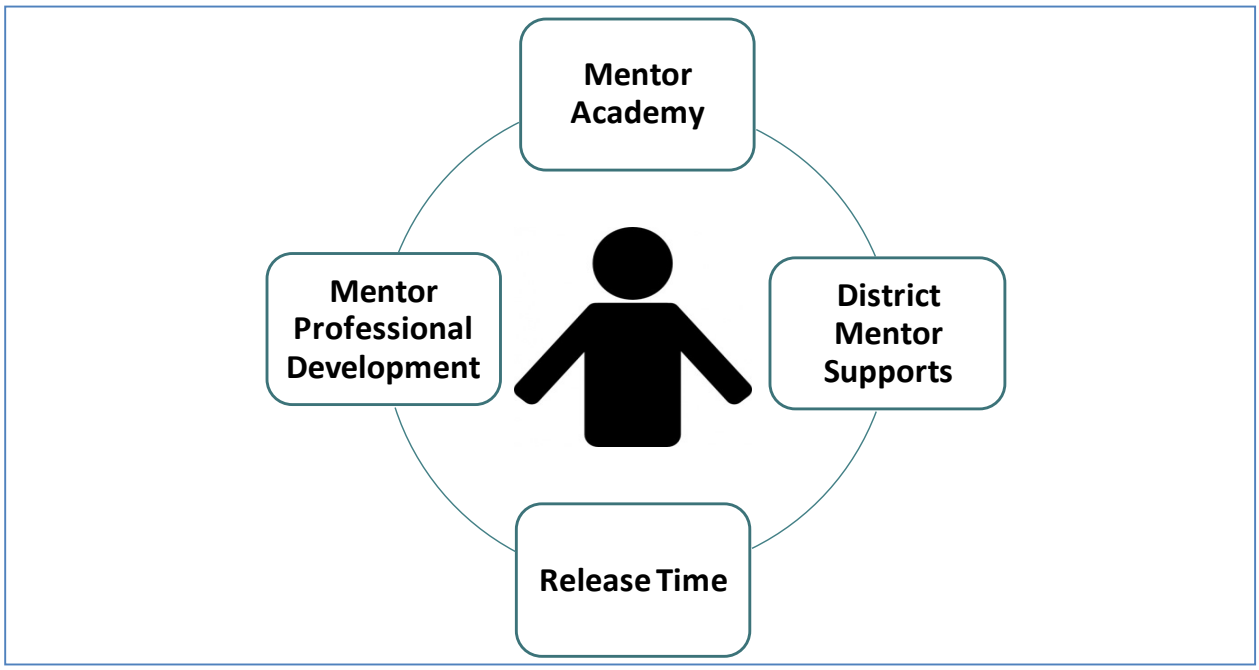

Figure 4. Elizabeth City Schools School-based mentoring support (Office of Teacher Support & Development, 2011)

Table 1
*Mentor Standards**

Standard 1:	Create intentional learning experiences to move learners from understanding to application
Expectation 1:	Provide relevant opportunities to support teacher growth on present level of performance
Indicator: 1	Use data to develop learning experiences that meet the individual and collective needs of beginning teachers
Expectation 2:	Facilitate interactive learning environments
Standard 2:	Build a culture of support for teaching and learning of new teachers
Expectation 1:	Provide evidence based feedback that leads to increased effectiveness on beginning teacher SMART goals
Indicator 1:	Feedback: Critique of observed behavior
Indicator 2:	Collaborate with the beginning teacher to develop a SMART goal based on evidence
Indicator 3:	Develop and implement a schedule of support for observation, consultation, feedback, and site-based new professional development
Expectation 2:	Implement a variety of coaching strategies and tools that are differentiated to learners needs
Indicator 1:	Demonstrates the strategy or skill the teacher is working to successful implement
Indicator 2:	Collaborates with the teacher to plan lessons based on teacher, student and curricular goals (planning)
Indicator 3:	Observes instruction with the intent of providing targeted support for teachers (observing)

*Mentor Standards are under development and in draft form (Office of Teacher Support & Development, 2013)

Research Focus

Elizabeth City Schools currently collects data to evaluate the implementation of its school-based mentoring program. This dissertation builds upon this existing work by providing additional insight into the relationship between school-based mentoring supports and ECT outcomes.

The dissertation study was guided by the following research foci:

1. Examine the relationship between receiving mentoring supports and mentor effectiveness to ECTs' outcomes including retention and Teacher Effectiveness Ratings.
2. Examine the relationship between mentor supports (i.e. release time, mentor training, and mentor professional development) on mentor activity and mentor effectiveness.

These research foci are guided by the School-Based Mentoring Model (see Figure 5) which contends that mentor supports are related to and will be reflected in the evidence of support including the Mentor Work Log, Mentor Report, Early Career Teacher Report, and District Mentor Report.

Evidence of support.

- *Mentor Work Log:* Electronic system through which school-based mentors track the frequency, duration, and types of interactions as aligned to the Mentoring Cycle of Development. Early career teachers receiving supports from school-based mentors also use the Mentor Work Log to track interactions with their school-based mentors.
- *Self-reported Data:* Information from School-based mentors, Early Career Teachers, and District Mentors is currently collected through self-report survey data that is not linked

across mentors and teachers. It is proposed that through this dissertation (see Figure 6), survey data will be linked across Mentors-Early Career Teachers-District Mentors and a new data point will be created: Mentor Standard Rating Instrument.

- *Mentor Standard Rating Instrument* (under development): This measure will be developed, piloted, and tested for validity and reliability. The purpose of this instrument is to measure school-based mentors' effectiveness score based on the Mentor Standards (see Table 1). The data will be triangulated based on the Mentor, Early Career Teacher, and District Mentor's responses on the Mentor Standard Rating Instrument.

Overarching research questions.

1.0 Is there a difference in mentor effectiveness as measured by the Mentor Standard Rating Instrument for school-based mentors depending on the type(s) of supports mentors access (i.e. Mentor Academy, Mentor PD, Release time, District Mentor Supports)?

2.0 Is there a difference in Mentor Work Log activity (i.e. frequency, activity type, duration) for school-based mentors depending on the type(s) of supports mentors access (i.e. Mentor Academy, Mentor PD, Release time, District Mentor Support)?

3.0 What is the relationship between school-based mentoring and Early Career Teacher Outcomes (i.e. self-reported retention, improved practice, and future career plans)?

Research questions.

1.0 Is there a difference in mentor effectiveness as measured by the Mentor Standard Rating Instrument for school-based mentors by their ECTs depending on level of supportiveness (i.e. helpfulness and frequency of accessing Mentor PD, District Mentors, Collaboration, Release Time, etc.) experienced by mentors?

1.1 Are mentor supports accessed (Mentor Academy, Mentor PD, Release time, District Mentors) predictive of changes in Mentor Standards Rating Instrument?

2.0 Is there a difference in Mentor Work Log activity (i.e. frequency, activity type, duration) for school-based mentors depending on the level of supportiveness (i.e. helpfulness and frequency of accessing Mentor PD, District Mentors, Collaboration, Release Time, etc.) experienced by mentors?

2.1 Are mentor supports accessed (Mentor Academy, Mentor PD, Release time, District Mentors) predictive of Mentor Work Log activity?

3.0 What is the relationship between school-based mentoring and Early Career Teacher Outcomes (i.e. self-reported retention, improved practice, and future career plans)?

3.1 Is there a difference in Early Career Teacher Outcomes depending on the level of supportiveness (i.e. helpfulness and frequency of accessing Mentor PD, District Mentors, Collaboration, Release Time, etc.) experienced by mentors?

3.2 Are mentor supports accessed (Mentor Academy, Mentor PD, Release time, District Mentors) predictive of Early Career Teacher Outcomes?

3.3 What is the relationship between Mentor Work Log Activity and Early Career Teacher Outcomes?

3.4 What is the relationship between Mentor Type (full release mentor) and Early Career Teacher outcomes?

This study used a quasi-experimental design to investigate the research questions because a random assignment (Shadish, Cook, & Campbell, 2002) of the mentors and mentor supports is not feasible in Elizabeth City Schools.

In Chapter 2 of this dissertation I conducted a review of the literature to explore the current research base on induction supports for ECTs with a specific focus on the relationship between mentoring and early career outcomes such as teacher retention and improved practice. I then explore what supports are related to mentor effectiveness with a specific focus on professional development of mentors and how mentor effectiveness can be measured. My review of the literature concludes with examining gaps in the literature which will reinforce the need for this dissertation study.

In Chapter 3, I outline the methodology I used in this study including my study participants, study setting, and the instrument I developed and validated. I define my variables and outcomes of interest, describe the procedure for data collection and provide a detailed description of my study design and plan for analysis. Chapter 4 presents the results for each research question. Chapter 5 presents a discussion of the findings, limitations, implications for the field of study, and ideas for future research.

Chapter 2: A Review of the Literature

Historical Perspective of Induction

Throughout history, induction has been an integral component of entry into various careers or professions from the guild system in the Medieval Times, to apprenticeships in skilled crafts, internships and clerkships in business and law, and residencies in medicine (Lortie, 1975). Induction is defined as the "formal act or process of placing someone into a new job, position, government office, etc." (www.m-w.com). As described by Lortie (1975), "typically the neophyte takes small steps from simple to more demanding tasks and from small to greater responsibility under the supervision of persons who have attained recognized position within the occupation" (p. 59). Although all professions have some form of induction, the duration, intensity, and type varies from brief onboarding, to learning on the job, to more extensive and complex processes like medicine that require specialized schooling, internships and residencies with senior staff, board exams, and fellowship training (Darling-Hammond, 2010; Lortie, 1975). In contrast to medicine, Darling-Hammond contended that "teaching today is where medicine was in 1910" (p. 196) because teachers enter the profession with a varying levels of skill and education and "with little mentoring, on-the-job coaching, or embedded professional learning opportunities" (p. 198). However, due to increasing complexity and awareness of educational and business institutions there has been an intensified focus on induction supports especially mentoring (Dominguez & Hager, 2013; Fransson & McMahan, 2013).

Overview of Induction Supports for Early Career Teachers

The most important factor in a student's education is the quality of the teacher who teaches the students (Darling-Hammond, 2010). However, from the research it is clear that teacher retention is a key concern because the majority of teachers do not remain in teaching

after five years (Hafner & Owings, 1991; Ingersoll, & Smith, 2003; Murnane, Singer, Willett, Kemple, & Olsen, 1991; Smith & Ingersoll, 2004). In fact, teacher turnover has been conservatively estimated to cost the state of Texas more than $300 million per year (Texas Center for Educational Research, 2000). This attrition and turnover can have significant impact on the field of education more generally and student achievement more specifically (Darling-Hammond, 2010). More generally the constant teacher churn can lead to instability in the profession where the constant influx of new teachers leaves a perpetual knowledge gap as partially trained teachers are constantly replaced by inexperienced teachers (Smith & Ingersoll, 2004). More specifically, a constant churn of new teachers especially in hard to staff areas and subjects means that some children are being taught by a continuous stream of new and inexperienced teachers the culmination of which can negatively impact student achievement (Darling-Hammond, 2010). In fact, the difference in teacher quality can mean a difference of a full grade level of achievement in a single year (Hanushek, 1992). Stanulis and Floden (2009) contended that novice teachers require three to seven years of teaching to have the strongest impact on student achievement. Unfortunately, at the point when teachers can begin to make the greatest impact on student achievement they have already left the profession (Alliance for Excellent Education, 2004).

To counteract this issue with teacher retention, a great deal of emphasis has been placed on teacher preparation programs to identify what works, what doesn't, how to best prepare teachers, and how best to retain teachers (Darling-Hammond, 2010; Smith & Ingersoll, 2004). Teacher preparation is delineated into two categories. The first type is pre-service which focuses on teacher preparation prior to a teacher entering a profession. This pre-service preparation usually includes educational coursework and student interning during which time the pre-service

teacher student teaches under the guidance of an experienced teacher. The second category is in-service preparation. During in-service preparation teachers receive supports often termed induction to support them as they experience their beginning years as a teacher (Darling-Hammond, 2010; Smith & Ingersoll, 2004). Induction supports usually include professional development specific to new teachers, mentoring by an experienced teacher, and in some instances additional resources like additional release time or reduced teaching load (Ingersoll & Strong, 2011).

With the influx of alternative certification programs these induction supports have become even more important since teachers who go through these programs have little to no access to pre-service preparation such as relevant coursework or student teaching (Hobson, Ashby, Malderez, & Tomlinson, 2009). Instead, alternative certification program participants often complete the majority of their educational coursework while teaching in their own classroom and rarely have an opportunity to student teach for an extended period of time (often student teaching takes place in summer programs which while experiential often does not provide enough context). This makes the need for high quality induction programs even more salient since the majority of supports for ECTs in these programs are provided during the in-service period. As the emphasis on induction programs has increased so has the number of teachers participating in these supports. Over the past two decades, the percentage of teachers participating has increased from 40% in 1990 to approximately 80% in 2008 with 22 states funding induction support programs (Education Week, 2008; Ingersoll & Strong, 2011).

Purpose of Literature Review

The purpose of this literature review will be to examine the literature of induction supports for ECTs which I have defined as teachers in their first 3 years of teaching. Induction

supports can include a host of different provisions including professional development series specific to new teachers, access to resources such as release time or reduced course load, and/or access to a mentor (Ingersoll & Strong, 2011). In alignment with the research questions that guide this research study, the primary focus of this literature review will be specifically on mentoring supports offered to ECTs coupled with the support mentors receive to guide their work with ECTs. Although the focus will be on mentoring, induction and mentoring are often used interchangeably and in many studies the individual effects of the supports are not necessarily teased out (Ingersoll & Smith, 2003; Long, McKenzie-Robblee, Schaefer, et al., 2012). Throughout this literature review I will delineate as best as I can between induction supports more generally and mentoring supports more specifically.

Definition of Mentor

A mentor is defined as "someone who teaches or gives help and advice to a less experienced and often younger person" (mw.com). In the Greek myth, Odysseus entrusted his friend Mentor with the care of his son Telemachus while he was at war with the Trojans. Athena, the goddess of wisdom, would often take the form of Mentor and impart knowledge and advice to the young Telemachus. In present day, the term mentor is often used for both personal and professional purposes. Likewise, it can be a formal or informal relationship. Formal mentoring supports can be seen in many different professions including medicine, business, skilled trades, and education (Ragin & Kram, 2007). Formal mentoring has been defined "as an organizationally and sponsored developmental relationship in which a more experienced senior mentor and a less experienced junior protégé are matched for the purposes of sharing organizational knowledge and advancing the protégé's career for a specified period" (Chun,

Sosik, & Yun, 2012, p. 1073). Across all these definitions is a common thread of providing support and guidance to new and inexperienced members of the profession.

In education, Neilsen, Barry, & Addison (2006) defined mentoring as a part of an induction program in which experienced teachers provide support for ECTs. Hobson, Ashby, Malderez, and Tomlinson (2009) defined mentoring "as the one-to-one support of a novice or less experienced practitioner (mentee) by a more experienced practitioner (mentor) designed primarily to assist the development of the mentee's expertise and to facilitate their induction into the culture of the profession (in this case, teaching) and into the specific local context (here, the school or college)" (p.207). Mentors can provide a multitude of supports including emotional support, instructional support through coteaching, modeling, or providing critical feedback, and assistance with planning or classroom management (Ingersoll & Strong, 2011).

Mentoring Frameworks

The ways mentoring programs are developed and implemented are rooted in the different theoretical frameworks ranging from development, learning, and social (Dominguez & Hager, 2013). In developmental mentoring, which is elucidated in Levinson's (1978) Career Stage or Life Stage Theory, mentoring is a support mechanism during the transitional stages in one's academic, professional, or personal life. In *Mentoring at Work,* Kram (1985) built upon the work of Levinson to define the roles of mentors and mentees and how these relationships can be affected by the different career stages of both individuals. Developmental theories of mentoring are cyclical theories which describe mentors' and mentees' relationships as they relate to specific developmental stages (Dominguez & Hager, 2013). Although the developmental framework can describe the mentoring relationship in different social and professional contexts it has an

inherent hierarchical structure which can lead to assumptions of "deficiency in mentees" (Dominguez & Hager, 2013, p. 175).

In contrast to the developmental mentoring framework, the learning theory framework focuses on the importance of partnered learning and the mentor as a facilitator (Dominguez & Hager, 2013). The different learning theories encompassed in this framework include constructivism, behaviorism, cognitivist theory and social learning theory (Driscoll, 2000). In contrast to the mentor supporting the mentee through different developmental stages, the mentor facilitates self-directed learning in mentees to promote confidence building (Daloz, 1999). Mentoring framed by learning theory is hallmarked by emphases on providing critical feedback on the part of the mentor and reflecting critically on the part of the mentee (Dominguez & Hager, 2013).

Mentoring framed within social theories envision "mentors as role models and mentees as active and observant apprentices" (Dominguez & Hager, 2013, p. 178). Mentors transmit societal expectations and information while mentees actively receive the information. Within this framework, there is an emphasis placed on the importance different mentoring relationships can have on social networking, socialization. However, a serious concern of mentoring within this framework is access to appropriate mentoring relationships in which the mentors and mentees are matched. Within the different frameworks, the outcomes for the mentees focus on retention and professional development. The difference lies in the mechanism and processes by which the mentor mentors his/her mentees.

Types of Mentoring and Mentoring Supports

From the organizational literature, mentoring supports can often be divided into three types of assistance: career support, psychosocial support, and role modeling (Chun, Sosik, & Yun,

2012; Kram, 1985; Scandura & Ragins). Career support includes "providing challenging assignments, giving job coaching, sponsoring career advancement, fostering positive exposure and visibility, and protecting protégés from adverse organizational forces" (Chun, Sosik, & Yun, 2012, p. 1073). This is in contrast to psychosocial supports which focus more on sharing of problems, relationship building and confirming the mentees' actions The third type of assistance, role modeling, recognizes the importance of the mentors' actions, values, and attitudes in guiding mentees (Chun, Sosik, & Yun, 2012). These types of assistance outlined in the organizational literature are also relevant to the mentoring relationship between mentors and ECTs in which mentors provide instructional coaching through lesson observation and analysis (Foster, 1999; Hobson, 2002; Hobson, Ashby, Malderez, & Tomlinson, 2009), psychological support to their mentees (Feiman-Nemser, 2001; Fletcher & Strong, 2009; Maynard, 2002) and role modeling through lesson modeling. The method and intensity through which these three types of mentoring supports: career, psychosocial, and role modeling are shared with a mentee varies depending on the type of mentoring the mentor adopts.

Norman and Feiman-Nemser (2005) identified two types of mentoring for ECTs: educative and limited. In educative mentoring the classroom is viewed as an opportunity for inquiry in which ECTs learn and develop their teaching practice. In contrast, the limited type of mentoring focuses on addressing ECTs' immediate questions and concerns without a focus on building practice (Feiman-Nemser, 2001). The purpose and function of mentoring is often shaped by district policy (Grossman, Thompson, & Valencia, 2001). Consequently, if the "mentors view induction support as helping novices acquire content-specific pedagogical knowledge, they may be more likely to provide them with instructional assistance. On the other hand, if mentors view induction support primarily as assistance with classroom management or orientation to school

context they may be less likely to provide instructional assistance" (Young, 2007, p. 802). Since the types of supports, scope, intensity, duration and fidelity of implementation can vary across and within programs it is important to review the literature to identify what if any relationship mentoring has with ECT outcomes (Evertson & Smithey, 2000; Feiman-Nemser & Carver, 2012; Ingersoll & Strong, 2011).

Importance of Mentoring for Early Career Teachers

In 2011, Ingersoll and Strong completed a systematic review of the induction literature. They searched educational databases using key terms including beginning teacher, induction, mentoring programs, and teacher mentors. Of the 500 studies initially identified, 150 were excluded due to their non-empirical nature. Of the remaining, 15 studies met the criteria for inclusion. The criteria were the studies needed to be non-descriptive, have more than one outcome, and the outcome had to be a specific outcome tied to the success of the ECT including retention, satisfaction, or student achievement (Ingersoll & Strong, 2011). The outcomes of focus in the 15 studies (see Table 2) included job satisfaction, teacher attrition and turnover, changes in teaching practices and student achievement. These outcomes are all important and interconnected as they relate to the success of ECTs. Job satisfaction is a key factor in teacher retention and teachers who continue to hone their craft are able to grow into better teachers who are more effective in raising student achievement (Darling-Hammond (2010). Due to this interconnectedness and the limitations of the current literature to tease out which outcome is more important, it is important to examine studies that explore a variety of outcomes. The results of the studies were mixed. Ingersoll and Strong identified key limitations to the studies which may have contributed to the mixed results including small sample sizes, lack of control or

comparison groups, and lack of controlling for other characteristics which may have confounded the results.

Table 2
Studies Examining the Importance of Mentoring on Early Career Teacher Outcomes

Study	Method	Independent Variable	Dependent Variable	Outcome	Limitations
Kapadia, Coca, & Easton (2007)	Teacher questionnaires of 1,737 ECTs (years 1-2) in Chicago Public Schools during 2004-2005 school year	Participation in district-wide induction program divided into weak, average, or strong by researcher based on level of supports reported by mentee	Teacher satisfaction, self-reported plans to remain in teaching and/or in current school	Significantly higher outcomes for strong induction. No significant difference between weak, average, and no induction	Controlled for mentee and school level factors. Not clear how induction was categorized as weak, strong, and average; self-reported
Cohen & Fuller (2006)	Teacher questionnaire	Participation in Texas Beginning Educator Support System (TxBESS) from 1999-2003	Teacher retention	Participants in TxBESS significantly higher retention than non-participants when matched on school type	Did not control for different types of induction, or self-selection intro program
Henke, Chen, & Geis (2000)	Secondary analysis of 1993 Baccalaureate and Beyond Survey (B&B: 93) (n = 7,294) teachers in 1992-1993 cohort who entered teaching	Self-reported participation in induction program	Teacher retention	Participation in induction was significantly and negatively related to teacher retention	Did not control for mentee level differences, or different types of induction

Table 2
Studies Examining the Importance of Mentoring on Early Career Teacher Outcomes

Study	Method	Independent Variable	Dependent Variable	Outcome	Limitations
Ingersoll & Smith (2004)	1999-2002 School and Staffing Survey (SASS) and 2000-2001 Teacher Follow-up Survey (TFS) (*n* = 3,235 first year teachers with no prior teaching experience)	Working with mentor in same subject area; regular and supportive interaction with principal or administration, common planning times, participating in community of teachers	Teacher retention	Mentor in same content, common planning, and communication with other teachers most strongly related to teacher retention. Reduced teaching load and extra classroom assistance were least correlated. The more supports a mentee received the higher the likelihood to be retained	Self-reported data
Hahs-Vaughn & Scherff (2008)	1999-2000 School and Staffing Survey (SASS) for first through fourth year teachers	Participation in induction in first year	Teacher retention	Induction had no relationship to teacher retention	Attempted to look at data longitudinally of multiple cohorts which leads to sample bias

Table 2
Studies Examining the Importance of Mentoring on Early Career Teacher Outcomes

Study	**Method**	**Independent Variable**	**Dependent Variable**	**Outcome**	**Limitations**
Duke, Karson, & Wheeler (2006)	1999-2000 School and Staffing Survey (SASS)	Participation in induction and field of undergraduate degree	Teacher report on intended length of time to remain in teaching	Induction had positive effect on retention	Attempted to look at data longitudinally of multiple cohorts which leads to sample bias
Davis & Higdon (2008)	Classroom observation and survey, (n = 10 first year teachers)	Access to university mentor in addition to district mentor	Teacher practice		No comparison to no mentoring; did not use statistical tests of significance
Roehrig, Bohn, Turner & Pressley (2008)	Surveys and classroom observation using AIMS tool of 6 first year teachers and mentors	Access to a trained mentor in addition to school-based mentor	Teacher practice	More effective teachers had more effective measures and communicated more with mentors	No comparison to no induction
Evertson & Smithey (2000)	Classroom observations of 46 randomly assigned teachers using RCI tool	Teachers randomly assigned to trained or untrained mentors Mentors participated in 3 day mentor training	Teacher practice	Significant differences in classroom management and student engagement for teachers with trained mentors	No comparison to no induction, did not control for frequency of mentor supports

Table 2
Studies Examining the Importance of Mentoring on Early Career Teacher Outcomes

Study	**Method**	**Independent Variable**	**Dependent Variable**	**Outcome**	**Limitations**
Stanulis & Floden (2009)	Classroom observation of 12 first year teachers using AIMS tool	Access to university mentor in addition to district mentor	Teacher practice	Significant difference in change in AIMS score for treatment group	No comparison to no induction, did not control for frequency of mentor supports or other factors
Thompson, Paek, Goe, & Ponte (2004)	Survey responses and interviews teachers in third year of teaching (Grades 3-5) (*n* = 287)	Level of induction support (low, middle, and high) from California Beginning Teacher Support and Assessment Program (BTSA)	Teacher practice and student achievement	Teachers with high level of induction in BTSA had significantly higher scores on teacher practices and student test scores	Nonrepresentative sample; did not control for background characteristics, validity and reliability of metrics
Fletcher, Strong, & Villar (2008)	Hierarchical linear modeling for mentoring programs in three California districts	Intensity of mentoring in year 2; Level 1: mentor with no release time; Level 2: mentor with release time and double caseload; Level 3: mentor with low caseload and release time	Student reaching achievement	Teachers with the highest level of mentoring support showed significantly higher student achievement gains compared with other levels of support	Could not distinguish school effects from district effects due to sample size

Table 2
Studies Examining the Importance of Mentoring on Early Career Teacher Outcomes

Study	**Method**	**Independent Variable**	**Dependent Variable**	**Outcome**	**Limitations**
Fletcher & Strong (2009)	Hierarchical linear modeling of ECTs in East coast urban district	Release time of mentor: no release time vs. full release	Student achievement	Teachers with mentors with release time had significantly higher student achievement	Could not distinguish school effects from district effects due to sample size
Rockoff (2008)	Instrumental variable to examine mentoring in New York City	Access to mentor	Student achievement	No significant difference in achievement depending on mentor access; Student achievement gains were significantly greater depending on time spent with mentor	Comparison group were teachers who were not eligible for mentors because of prior teaching experience; not true comparison

Table 2
Studies Examining the Importance of Mentoring on Early Career Teacher Outcomes

Study	**Method**	**Independent Variable**	**Dependent Variable**	**Outcome**	**Limitations**
Glazerman, Dolfin, Bleeker, Johnson, Isenberg, Lugo-Gil, & Ali (2008). Glazerman, Isenberg, Dolfin, Bleeker, Johnson, Grider, & Jacobus (2010) Glazerman, Senesky, Seftor, & Johnson, (2006) Isenberg, Glazerman, Bleeker, Johnson, A., Lugo-Gil, Grider,& Dolfin, (2009).	Mathematica randomized control trial of 1,009 beginning teacher in 418 schools in 17 districts; classroom observations survey data collected over 3 years from 2006-2008	Comprehensive mentoring offered through Educational Testing Service (ETS) or New Teacher Center (NTC); mentors received training	Teacher retention, teacher practices, student achievement	No significant difference between teacher practice after one year, retention after three years, or student achievement after 2 years. Significant difference in student achievement after third year.	Issues with fidelity of implementation

Adapted from Ingersoll & Strong (2011).

Ingersoll and Strong's (2011) critical review is indicative of valid concerns with the mentoring literature more broadly. This is reiterated in a literature review on mentoring and its relationship to teacher attrition and retention conducted by Long, McKenzie-Robblee, Schaefer, Stevens, Wnuk, Pinnegar, and Clandinin (2012). Similar to Ingersoll and Strong's (2011) review, this review (Long, McKenzie-Robblee, et al., 2012) indicated mixed results with some evidence that mentor-mentee relationships have more positive outcomes when content/grade levels are matched (Whitaker, 2000). Additionally a relationship between structured observational supports and mentor effectiveness was shown (Roehirg, Bonn, Turner, & Pressley, 2008). However, this study had a small sample size ($n = 6$) and mentor effectiveness was measured by a teacher self-report on a non-validated scale. These reviews of the literature provide evidence of the types of mentoring supports that are related to positive ECT outcomes like increased retention and career satisfaction.

The relationship between mentor and mentee is an important factor in the apparent success of mentoring to ECT outcomes. Carter and Francis (2001) found that mentoring relationships were more effective if mentors and mentees had choice in their relationship compared to those mentor-mentee pairs that were assigned. Likewise, proximity in location as well as grade and content level were related to perceived mentor effectiveness (White & Mason, 2006). An analysis of the 1999-2000 School and Staffing Survey (SASS), found that "having a mentor in one's field reduced the risk of leaving at the end of the first year by 30%" (Smith & Ingersoll, p. 702). Feiman-Nemser and Carver (2012) comparing three induction programs through a qualitative analysis identified "proximity, grade-level, and/or subject matter matches, [and] personal compatibility" (p. 343) are related to the quality of mentoring. Furthermore, Young's (2007) qualitative case study of two districts with eight teachers in each district, argued

that selecting mentors based on content and grade level does matter in the effectiveness of mentoring relationships.

In addition to the alignment of content and grade level, availability of mentors to support teachers is also important (Feiman-Nemser & Carver, 2012) specifically frequency and release time to focus on mentoring (Appolloni, 2009; Hobson, et al.; Lee & Feng; Robinson & Robinson, 1999). A quasi-experimental study of the relationship between mentor release time and student achievement indicated that students "associated with full-release mentors had better achievement gains than students associated with site-based mentors" who had no release time (Fletcher & Strong, 2009, p. 339). However, the sample size was small with only 4 mentors and a total of 28 teachers across two grade levels. Additionally, the analysis did not control for teacher, mentor, or student characteristics. As a result the differences in student achievement "may be accounted for by cross-school difference or some other unknown factors" (Fletcher & Strong, p. 340) instead of the variable of mentor release time. Roehrig, Bohn, Turner, and Pressley (2008) found in a qualitative case study of six ECTs that teachers who were more effective spent more time with their mentors. A study by Stanulis and Floden (2009) compared 24 beginning teachers with a matched comparison group found that the level of mentoring supports including mentor release time were positively related to an increase in teachers' scores on the AIMS observation tool. This study provides further support of the importance of release time for mentors to support their teachers. However, it is difficult to tease out what precisely about the release time of mentors is related to positive early career outcomes such as improved teacher performance, teacher retention, and/or student achievement. This release time often is in conjunction with a larger constellation of mentoring supports. For instance, in the Stanulis and Floden (2009) study, the treatment group received a full release mentor who provided intensive mentoring from a mentor who received mentoring professional development. Consequently, it

is important to examine what other mentoring supports are related to ECT outcomes in addition to time.

According to Hobson, Ashby, Malderez, and Tomlinson (2009), "mentoring is most effective where it is fit for and responsive to the needs of the mentee/learner" (p. 212). The authors identify mentoring strategies including the availability and approach of the mentor to his/her mentee. The authors contend that mentors must respect mentees as adult learners allow mentees' autonomy, and provide challenging yet scaffolded opportunities for mentees (Feiman-Nemser; Foster, 1999; Hobson, et al.; Lindgren, 2005). Furthermore, there should be a focus on lesson observation and analysis in which the objectives are agreed upon in a pre-observation conference, the observation is conducted in a non-threatening, non-evaluative way and provides specific and constructive dialogue between the mentor and mentee (Foster; Hobson, et al.; Johnson, 2002; Martin & Rippon, 2003; Schmidt, 2008). These suggestions are supported and expanded on by Ganser (1996) who identified important mentoring skills to also include: conferencing, problem solving, goal setting, teacher observation and analysis as well as role-playing. These skills are in contrast to what mentors reported as their most frequent roles including providing emotional support, information about school policies, culture, and procedures; and assistance with classroom management, discipline, and teaching skills (Ganser, 1996). Matsko (2010) examining the outcomes for 1737 ECTs who received induction supports in Chicago, found that the "kinds of mentoring activities that are least often received …are the most strongly correlated with their decisions to remain teaching in the same school" (p. 7). In fact, "novices who receive a variety of mentoring activities including those that are more rigorous in nature [e.g. mentoring or instruction, analysis of student work, exploring student assessment] than providing accessibility and general emotional support get the most impact from them" (Matsko, 2010, p. 9). The question then becomes why do mentors provide those

actions or supports that are most effective in retaining teachers less often? I contend the answer lies in professional development or the lack thereof that mentors receive.

Professional Development of Mentors

Evertson and Smithey (2004) argued that not only the selection of mentors but also their training and continuing professional development influence the mentors' role and their effectiveness. However, as Feiman-Nemser and Carver (2012) contended "unfortunately, many mentoring programs seem to rest on the assumption that those who know how to teach automatically know how to assist a novice in learning to teach" (p. 344). In a qualitative study comparing three induction programs, Feiman-Nemser and Carver (2012), reported that although mentoring was a core component of the induction programs, only two of the programs mandated training for the mentors. Feiman-Nemser and Carver (2012) further argued in order to support serious mentoring, induction programs need to provide mentors with a contextual understanding of the goals of the program as well as to provide initial and ongoing professional development for mentors in order to effectively support and guide the learning of ECTs. In a survey of 398 mentors working in Wyoming Public Schools, the largest barriers these mentors faced were lack of time, limited guidance, and no training on how to be a mentor (Stock & Duncan, 2010). This need for professional development is echoed in the qualitative work of Ganser (1996) who recognized that "mentoring is a new role for experienced teachers calling for knowledge and skills related but not identical to those of effective teaching" (p. 36).

Without this professional development, mentors often resort to a 'reductive' approach to mentoring, in which mentors offer ECTs "quick-fix solutions frequently in the form of workshops and resources" (Achinstein & Athanses, 2006, p. 38) instead of leveraging more robust strategies such as observation and modeling to aid with teacher development and education (Achinstein & Athanses; Langdon, 2014). Furthermore, restrictive or reductive

mentoring may in fact lead to the promotion and reproduction of low quality and not reform-minded pedagogy (Feiman-Nemser, Parker, & Seichner, 1993; Hobson, et al., 2009; Wang & Odell, 2002). In a qualitative study of 13 mentors which provided professional development to mentors on the importance of substantive conversations between mentors and mentees, Langdon (2013) concluded that "unless mentors are provided with opportunities to learn about mentoring and how teachers develop, they will remain an under-utilized resource, primarily concerned with enculturation of new teachers to fit in" (p. 38). Bullough (2005) recommended that professional development of mentors needs to go beyond training to include helping mentors to build their identity as mentors which is something separate, requiring a different skill set than teaching. Seminars or professional learning communities (PLCs) are recommended to provide mentors an avenue to hone mentoring their skills, share their experiences with other mentors, and reflect on their own experiences as mentors (Bullough; Cheng & Yeung, 2010; Hobson, et al., 2009).

In addition to providing professional development to support mentors in their work, Feiman-Nemser and Carver (2012) contend that "investing in professional development of mentors has the added benefit of producing a cadre of teacher leaders who can help foster a culture of collaboration and accountability in schools and district" (p. 360). This benefit of mentoring has been further echoed by Pajak and Carr (1993) who contend mentor teachers can provide support for new teachers while not only alleviating some of the stress on administrators but also gaining new skills and challenges as experienced educators. Through the role of mentor, these experienced educators can gain new competencies (Fletcher & Strong, 2009), rediscover and rejuvenate parts of their teaching ethos (Fletcher & Strong, 2009; Kram, 1985), and become more self-aware of how their teaching practice affects student learning (Clarke, 2006; Yost, 2002). An additional benefit to mentoring ECTs is that mentors learn from their ECTs and are exposed to new pedagogical skills and theories (Bullough, 2005; Cheng & Yeung, 2010; Yost,

2002). A mixed-methods study of 101 mentors of pre-service teachers by Hudson (2013) indicated that the "majority of these mentors surveyed engaged mentees across the pedagogical knowledge practices in each of the subject areas not only for the mentees' development but also for their own development" (p. 780). The qualitative portion of the study in which 10 experienced mentors were interviewed further supported the finding that mentors found the mentoring relationship to be mutually beneficial in building communication and leadership skills. This idea of the act of mentoring as a powerful and cost-effective means of professional development for experienced teachers has been reiterated in the literature as an additional benefit (Hagger & McIntyre, 2006; Hudson, 2013; Langdon, 2014) as well as increasing an experienced teacher's self-worth and professional status (Bodocsky & Malderez, 1997; Hobson, et al., 2009; Wright & Bottery, 1997).

Synthesis

Although the literature suggests that mentoring is related to retention and improved effectiveness in ECTs, there are concerns within the literature specifically as it relates to sample size, lack of comparison groups, and controlling for confounding variables (Ingersoll & Strong, 2011; Smith & Ingersoll, 2003). Long, McKenzie-Robblee, et al. (2012) summarized the key concern with the mentoring literature on teacher attrition but I feel it can be applied to the literature more broadly: "The effect of induction (including mentoring) programs is unclear in the light of multiple factors that influence teachers' staying or leaving. Complexities in induction (including mentoring) programs stem from differing ways they are conceptualized and the differing ways they are lived out" (p. 22). Within the mentoring component of an induction program, variability lies in the quality of mentors, the professional development they receive, and the supports they provide for ECTs which often leads to mixed results in the literature (Fletcher, Strong, & Villar, 2008; Hobson, et al., 2009). In fact Hobson, Ashby, Malderez, and

Tomlinson (2009) argued that the "evidence base on the actual effects of different kinds of mentor preparation and support is generally rather sparse and underdeveloped (p. 212). In line with this argument, Smith and Ingersoll (2004) proposed a new research question based on these existing issues within the literature, "Is there a significant difference in effectiveness between induction and mentoring programs depending on how mentors are selected, the kind of training they are given, and the degree to which they are compensated for their participation" (p. 704). In this dissertation, I will focus on two aspects of this question posed by Smith and Ingersoll (2004): mentor training and compensation in the form of release time. In doing so, I hope to shed more light onto the effectiveness of mentoring by focusing not only on its relationship to early career outcomes, but also to examine the relationship between mentor training and release time to mentor effectiveness.

Measuring Mentor Effectiveness

A key piece to this dissertation is measuring the effectiveness of mentors in their mentoring roles. How do we know if the mentoring is effective and is related to early career outcomes such as retention and effectiveness? In a meta-analysis of more than 300 studies on educational mentoring, Ehrich, Hansford, and Tennent (2004) reported mostly positive results for both the mentors and mentees. However, the authors concluded that most of the studies' findings "consisted of testimonials and opinions rather than findings based on scientific techniques" (Fletcher, Strong, & Villar, 2008, p. 2273). In response to this critique, I examined the literature to identify a scale or metric by which to measure mentor effectiveness. In this search I located a dissertation in which Collins, Deist, and Riethmeier (2008) reviewed the literature to identify existing themes of high quality mentoring. These standards which were then reviewed by content experts encompassed six elements that included: careful selection and pairing of mentor and mentee, provision for mentor training, demonstrated pedagogical expertise of mentor, ability

of mentor to provide emotional support, ongoing and frequent meetings between mentor and mentee, and an opportunity for new teachers to observe the mentor. These standards speak more to quality of a mentoring program than specific actions of the mentor. Since these standards pertain more generally to a mentoring program, compared with the mentors' actions and are not accompanied by a valid instrument, my plan to develop and validate a mentor rating instrument based on the mentoring standards (see Table 1) adopted by Elizabeth Schools was a necessary endeavor. In the social sciences, the use of a measure allows for the quantification of attributes in a repeatable and standardized way which leads to "enhance[d] social science objectivity" (Netemeyer, Bearden, & Sharma, 2003, p. 3). Since this literature review has not identified a scale or metric for mentor effectiveness, it is recommended and necessary that I develop such an instrument.

Summary

This chapter focused on a review of the literature starting with a historical perspective of career induction with its roots in the guilds of Medieval Europe and evolving over the centuries through apprenticeships, internships, and residencies of skilled craftsmen and professionals (Lortie, 1975). From there, the focus narrowed to induction supports for ECTs, specifically professional development, access to a mentor, and release time (Ingersoll & Strong, 2011). Induction supports for ECTs are essential not only to support development of skilled professionals but also to promote teacher retention, effectiveness, and ultimately student achievement (Darling-Hammond, 2010). Although induction supports more broadly can support early career development, this dissertation's focus is on mentoring specifically. As such, this literature review concentrated on mentoring, first defining it as a relationship between a more experienced and less experienced person to support the less experienced person's induction into

the profession (Chun, Sosik, & Yun, 2012). In teaching, mentoring can take the form of providing emotional support,

Instructional support, coteaching, modeling, providing feedback, and assistance with plan or classroom management (Ingersoll & Strong, 2011). Mentoring is grounded within different theoretical frameworks including developmental, learning, or social (Dominguez & Hager, 2013). Mentoring in a developmental frame emphasizes the importance of mentors as providing supports to mentees during times of transition. In contrast, mentoring framed within a learning context promotes the notion of mentors as facilitators and mentees as actively engaged in the learning process. Mentoring framed within social theory stresses the value of mentoring as promoting socialization and networking (Dominguez & Hager, 2013). These mentoring frameworks provide additional context for the types of mentoring and mentoring supports that ECTs experience whether it be social-emotional, role modeling, or content specific career support (Kram, 1985).

An examination of mentoring studies identified factors that may be connected to positive ECT outcomes such as matching of mentor and mentees on content and grade level, professional development of mentors, and frequency of mentoring (Appolloni, 2009; Evertson & Smithey, 2000; Feiman-Nemser & Carver, 2012). In addition to these variables it is important to explore the quality of the mentors. To be an effective mentoring program, mentors must also be trained and receive professional development on how to best support ECTs (Feiman-Nemser & Carver, 2012). Although the research literature provides evidence of how mentoring supports and support for mentors are related to ECT outcomes such as retention and effectiveness, it is plagued by small sample size, variability of mentoring programs, issues with fidelity, and lack of comparison groups (Ingersoll & Strong, 2011). One step towards addressing the issue of variability is identifying a metric by which mentor effectiveness can be measured. Since an

examination of the literature did not uncover such a metric, one was developed as part of this study. In Chapter 3, I describe the validation of such a metric and its use in a study to explore the relationship between mentor effectiveness and mentoring supports on ECT outcomes.

Chapter 3: Method

Study I: Instrument Development

The Mentor Standard Rating Instrument (MSRI) was developed by the researcher in collaboration with Elizabeth City Schools Coordinator of School-Based Mentoring. The MSRI is grounded in the Mentor standards adopted by Elizabeth City Schools (see Table 1). The Mentor Standards focus on two standards. Standard 1 focuses on instructional practices and Standard 2 focuses on content. Each standard has an expectation which is further broken down into indicators.

An expectation is defined as "a measurable stepping stone to be effective with the standard" (Office of Teacher Support & Development, 2013). An indicator is defined as "action items that demonstrate mastery of an expectation. Indicators are guides for effectiveness and not an exhaustive list of what can be done to master a standard" (Office of Teacher Support & Development, 2013). The MSRI is a 4 point Likert scale with three versions: District Mentor Version, School-based Mentor Version, and Early Career Teacher Version. The four points of the MSRI will be Novice, Developing, Emerging, and Applying. Each standard, expectation, and indicator will be measured by multiple items.

A pilot study of the instrument was undertaken in order to test the dimensionality, validity, and reliability of the scale (Netemeyer, Bearden, & Sharma, 2003). The MSRI was created and shared with stakeholders including the Coordinator of Mentoring (n = 1), District Mentors (n = 3), and Teacher Support & Development staff (n = 3) to determine its face validity. Face validity will be used as an initial screening to determine if the instrument appears to measure what it purports to measure (Gay, Mills, & Airasian, 2006). However, after this initial screening, it was important to investigate the content validity of the instrument (Gay, Mills, & Airaisan, 2006). The Coordinator of Mentoring (n =1) and District Mentors (n = 3) reviewed

the instrument to determine its content validity by making "a judgment about how well items represent the intended content area (Gay, Mills, & Airaisan, 2006, p. 135). Upon review of the MSRI, the content experts approved the content and believe it aligned with the Mentor Standards.

Once the face and content validities were assessed and the MSRI was finalized, an online version of the MSRI was sent to mentors (n = 200) and ECTs (n = 1,300) in May 2013 as part of the end of 2012-2013 Induction Survey. Construct validity was assessed to determine that the instrument "measures the intended construct and not some unanticipated, intervening variable" (Gay, Mills, & Airaisan, 2006, p. 137). In addition to the validity study, internal consistency reliability testing will be undertaken to examine the split-half reliability (Gay, Mills, & Airaisan, 2006).

Study II: Mentoring Research

Participants. The researcher will invite school-based mentors (n = 200) and mentees (n = 1,300) to participate in the full research study during the 2013-2014 school year. Participants will be invited through online surveys during the ECT summer orientation, summer Mentor Academy, and during the first few weeks of school to participate.

Mentees.

Mentees are ECTs who are in their first through third year of teaching in the district. These mentees include teachers who have gone through traditional and alternative certification routes. Additionally, all teachers in their first through third years in the Elizabeth Schools are assigned school-based mentors regardless of their previous teaching experience in private schools or other public school districts. There are approximately 1,300 ECTs in Elizabeth Schools that will be invited to participate.

Mentors.

Mentors are school-based staff who are identified by their principal to provide mentoring supports to ECTs in compliance with COMAR regulations for ECT supports (COMAR 13.A.07.01 Comprehensive Teacher Induction Program; Education Article, §§2-205(c), 5-206-1, and 6-202(b), Annotated Code of Maryland). There are approximately 200 school-based mentors. These mentors may be full-time teachers, full release mentors, or have other school-based roles including staff developer or department head. Mentors are not compensated financially for their role as a school-based mentor.

Setting

Elizabeth Schools is an urban school district in a mid-sized city in the Mid Atlantic. Its approximately 6.000 teachers educate roughly 80,000 students PreK through Grade 12 in 200+ schools. It has a high rate of student mobility, students receiving free and reduced lunch, and high teacher and administrator turnover. As a decentralized school system, school leaders have a great deal of autonomy in budgeting, staffing, and curricular decisions. Approximately 1,300 of Elizabeth Schools' teachers are in their first three years with the district. Roughly half of these are in their first year teaching.

Variables

In order to address the overarching research questions of how mentor characteristics are related to mentor outcomes including mentor activity and efficacy, as well as how mentor efficacy is related to ECT outcomes, independent, dependent, and control variables (see Table 2) have been identified. Independent variables include mentor characteristics including site-based mentor type and participation in mentor supports. Dependent variables of interest include mentor work log activity, MSRI rating, mentor self-reported outcomes, ECT self-report

outcomes. Mentor, ECT and school level characteristics will be used as control variables as further explained in the Analysis section below (see Table 3).

Table 3
Variables of Interest

	Indicator	**Source**
Independent Variables	Site-Based Mentor Type/Amount of Release time: • Full time teacher • Full time mentor • Instructional Support Personnel	Self-report from Mentor survey
	Participation in Mentoring Supports • Mentor Professional Development • Level of District Mentoring Supports	Self-report from Mentor survey
Dependent Variables	Mentor Work Log • Frequency • Duration • Types of teacher-mentor interactions	Self-report from Mentor Work Log
	Mentor Standards Instrument • Mentor self-reported score • District mentor score • Early Career Teacher score	Self-report from MSRI
	Mentor self-report • Retention • Change in practice	Self-report from Mentor survey
	Early Career Teacher self-report • Retention • Change in practice • Changes in practice	Self-report from Early Career Teacher survey
	Instructional Framework Rating	Employment records

Table 3
Variables of Interest

	Indicator	**Source**
Control Variables	School-Based Mentor • Years of teaching experience • Years of mentoring experience • Educational level • Race, gender, age • Mentor: Teacher ratio • Cohort: alternative vs. traditional certification	Self-report from Mentor survey
	Early Career Teacher • Years of teaching experience • Cohort: alternative vs. traditional certification • Educational level • Race, gender, age	Self-report from Early Career Teacher survey
	School Characteristics • School structure • % FARM • % minority • % ECTs • Adequately Yearly Progress (AYP) status	Public records from district website

Procedure

The quasi-experimental design was a pre-posttest design (Shadish, Cook, & Campbell, 2002) with a pre-test MSRI administered in the fall of 2013 and the post-test MSRI administered in April 2014. Data from school-based mentors and ECTs was collected as part of the ongoing evaluation of the Induction Program in Elizabeth City Schools through online surveys that included questions about experiences of the mentors and ECTs as well as completion of the MSRI (see Table 4). The Coordinator of Mentoring and Coordinator of New Teacher Support

sent out reminder emails and incentivized the survey. See Table 5 for a list of specific research questions and proposed analyses.

Table 4
*Data Collection**

Data Collection	**Participants**	**Timeframe**
Completion of online Mentor Standards Rating Instrument- Pilot	Teacher, School-Based Mentor, District Mentor	May 1, 2013- June 1, 2013
Completion of online Induction: End of Year survey	Teacher, Mentor	May 1, 2013-June 1, 2013
Completion of online Induction-Survey Beginning of Year **(including Mentor Standards Rating Instrument)**	Teacher, Mentor, District Mentor	August 2013-September 2014
Completion of Mentor Work Log	Teacher, Mentor	August 2013-June 2014
Completion of online Induction Survey-End of Year **(including Mentor Standards Rating Instrument)**	Teacher, Mentor,	April 2014

*Data collection activities in **bold** are in addition to the activities Elizabeth City Schools would be doing normally.

Table 5
Research Questions and Proposed Analyses

	Independent Variable(s)	**Dependent Variable**	**Proposed Analysis**
1.0 Is there a difference in mentor effectiveness as measured by the Mentor Standard Rating Instrument for school-based mentors by their ECTs depending on level of supportiveness (i.e. helpfulness and frequency of accessing Mentor PD, District Mentors, Collaboration, Release Time, etc.) experienced by mentors?	Supported vs. NonSupported Composite Score	Mentor Standards Rating Instrument-Post Test	Composite score will be created for Supported vs. NonSupported Mentors using SPSS. Propensity score analysis (Rosenbaum & Rubin); Shadish, Cook, & Campbell) will be used to calculate ATE for Supported vs. NonSupported Mentors on mentor effectiveness.
1.1 Are mentor supports accessed (Mentor Academy, Mentor PD, Release time, District Mentors) predictive of changes in Mentor Standards Rating Instrument?	Supports accessed (number and dosage)	% Change in Mentor Standards Rating Instrument(PostTest-PreTest	Multiple regression controlling for Mentor Characteristics, Early Career Teacher Characteristics, School Characteristics

Table 5
Research Questions and Proposed Analyses

	Independent Variable(s)	**Dependent Variable**	**Proposed Analysis**
2.0 Is there a difference in Mentor Work Log activity (i.e. frequency, activity type, duration) for school-based mentors depending on the level of supportiveness (i.e. helpfulness and frequency of accessing Mentor PD, District Mentors, Collaboration, Release Time, etc.) experienced by mentors?	Supported vs. NonSupported Composite Score	Mentor Work Log Activity	Composite score will be created for Supported vs. NonSupported Mentors using SPSS. Propensity score analysis (Rosenbaum & Rubin; Shadish, Cook, & Campbell) will be used to calculate ATE for Supported vs. NonSupported Mentors on Mentor Work Log Activity.
2.1 Are mentor supports accessed (Mentor Academy, Mentor PD, Release time, District Mentors) predictive of Mentor Work Log activity?	Supports accessed (number and dosage)	Mentor Work Log Activity (frequency and type)	Multiple regression controlling for Mentor Characteristics, Early Career Teacher Characteristics, School Characteristics
3.0 What is the relationship between school-based mentoring and Early Career Teacher Outcomes (i.e. self-reported retention, improved practice, and future career plans)?	Mentor Standards Rating Instrument	Early Career Teacher Outcomes (i.e. self-reported retention, improved practice, and future career plans)	Multiple and Logistic Regressions controlling for Mentor Characteristics, Early Career Teacher Characteristics, School Characteristics

Table 5
Research Questions and Proposed Analyses

	Independent Variable(s)	**Dependent Variable**	**Proposed Analysis**
3.1 Is there a difference in Early Career Teacher Outcomes depending on the level of supportiveness (i.e. helpfulness and frequency of accessing Mentor PD, District Mentors, Collaboration, Release Time, etc.) experienced by mentors?	Supported vs. NonSupported Composite Score	Early Career Teacher Outcomes (i.e. self-reported retention, improved practice, and future career plans)	Composite score will be created for Supported vs. NonSupported Mentors using SPSS. Propensity score analysis (Rosenbaum & Rubin; Shadish, Cook, & Campbell) will be used to calculate ATE for Supported vs. NonSupported Mentors on Early Career Teacher Outcomes.
3.2 Are mentor supports accessed (Mentor Academy, Mentor PD, Release time, District Mentors) predictive of Early Career Teacher outcomes?	Supports accessed (number and dosage)	Early Career Teacher Outcomes (i.e. self-reported retention, improved practice, and future career plans)	Multiple and Logistic regressions controlling for Mentor Characteristics, Early Career Teacher Characteristics, School Characteristics
3.3 What is the relationship between Mentor Work Log Activity and Early Career Teacher Outcomes?	Mentor Work Log Activity	Early Career Teacher Outcomes (i.e. self-reported retention, improved practice, and future career plans)	Multiple and Logistic regression controlling for Mentor Characteristics, Early Career Teacher Characteristics, School Characteristics

Table 5
Research Questions and Proposed Analyses

	Independent Variable(s)	**Dependent Variable**	**Proposed Analysis**
3.4 What is the relationship between Mentor Type (full release) and Early Career Teacher outcomes?	Mentor Type (i.e. full release mentor)	Early Career Teacher Outcomes (i.e. self-reported retention, improved practice, and future career plans)	Multiple and Logistic regressions controlling for Mentor Characteristics, Early Career Teacher Characteristics, School Characteristics

Design and Analysis

Ideally, a randomized experiment would be used to estimate the effect of mentoring supports and mentor type (i.e. release time) on mentoring effectiveness, mentor activity, and Early Career Teacher outcomes because randomization ensures comparison groups are comparable on covariates and thus allows for the estimation of the treatment effect of interest (Rosenbaum, 2005a). However, in some instances randomized experiments are not practical or ethical. In order, for a randomized experiment to be conducted Rosenbaum (2005a), indicated three keys tests: the treatment is beneficial and not harmful; it is unclear what the best treatment is; and "the investigator can control the assignment and delivery of treatments" (p. 1). In the case of this proposed study, it is neither ethical nor feasible (e.g. political constraints) for the investigator to assign mentors to different levels of support or mentor types (i.e. amount of release time). Consequently, an observational study is needed.

Propensity score matching will be used to estimate the average treatment effect (ATE) of mentor supports on mentor effectiveness as measured by the Mentor Standard Rating Instrument (1.0) and Mentor Work Log Activity (2.0) and the ATE of mentor supports on Early Career Teacher Outcomes (3.1). A composite variable will be created using SPSS (IBM, 2010) for

Supported (i.e. accessing mentor supports) vs. NonSupported (i.e. not accessing mentor supports) mentors.

Rubin (2007) described an observational study as a "broken randomized experiment" (p. 25). As a result, it is necessary to reconstruct the randomized experiment through the use of propensity scores (Rubin, 2007). Propensity scores are a summary of all the observed covariates that gives the likelihood of being in the treatment group (Rubin, 2001; Stuart, 2010). According to Rubin, "in a randomized experiment, the propensity scores are known, whereas in an observational study, they must be estimated from the data" (p. 171). Therefore, if the estimated propensity scores have the same distribution for both treatment and control you can approximate a randomized experiment (Rubin, 2007).

The key assumptions of using matching methods such as propensity scores are the Stable Unit-Treatment Value Assumption (SUTVA) which assumes that the treatment assignment of one does not affect the outcomes of others and that there is one treatment version; and that the propensity scores be well balanced (Little & Rubin, 2000; Stuart, 2010). In order to meet the assumption of ignorable assignment, Stuart (2010) argued "it is important to include in the matching procedure all variables known to be related to both treatment assignment and the outcome" (p. 9). As such, for the purposes of this observational study I am proposing to use the observed mentor covariates identified in Table 3. Although the inclusion of additional covariates might add to the variance, it will hopefully lead to less bias (Stuart, 2010). This is consistent with Rubin's (2007) view that propensity scores methods are meant to reduce bias, not "to increase precision" (p. 25).

Matching methods.

The statistical software package add-on psmatchit from R will be used to create propensity scores in SPSS 20 (IBM) for the observed covariates identified in Table 2. Various types of matching will be done including nearest neighbor optimal with and without replacement, subclassification, and full matching to determine which matching method type produces the best balance (Stuart).

Balance of the propensity scores will be examined using both graphical diagnostics such as jitter plots, a standardized difference of means (Stuart) and a comparison of standardized biases (Stuart & Green, 2008).

Outcome analysis.

After well-balanced propensity scores are created, the ATE can be estimated by using a logistic regression to estimate the effect of mentor support on mentor effectiveness, mentor work log activity, and Early Career Teacher outcomes as well as the effect of mentor type (i.e. release time) on Early Career Teacher outcomes using SPSS 20 (IBM) (see Table 4). Sensitivity analyses will need to be conducted to determine how much hidden bias can be present before the analysis of the outcomes begins to change (Rosenbaum, 2005b).

Chapter 4: Results

This study investigates the development of a valid and reliable instrument to examine the relation between mentoring supports and ECT outcomes.

Study I: Instrument Validity and Reliability

The Mentor Standards Rating Instrument (MSRI) was tested for reliability and validity using a sample of mentors (n = 45) and ECTs (n = 143) in the spring of 2013. The MSRI is a 26 item Likert type scale with two forms: mentor and ECT. The only difference is the intended audience. For instance, the mentor item is worded: "I collaborated with my ECT…" compared with the ECT item which would be "My mentor collaborated with me…" This was 83.3% of mentors who completed the Mentor End of Year survey (n = 54) and 43.9% of ECT who completed the Early Career Teacher End of Year Survey (n = 326).

Mentor form. The Mentor sample (n = 45) was tested for internal consistency using Cronbach's alpha. The MSRI-mentor form has 23 items (α =.871). The MSRI-mentor was found to be highly reliable (26 items; α = .871). The MSRI was created based on two mentoring standards. A confirmatory factor analysis was conducted to determine if the instrument statistically defined two factors. The MSRI-mentor (n = 45). A principal components extraction with varimax rotation was performed for a sample of 45 mentors, who responded to the 26 items. The two factor solution (see Table 6) accounted for 69.4% of the variance in the instrument. A one factor solution accounts for 61.0% of variance.

Table 6
Rotated Component Loadings for MSRI-mentor

Item #	Mentor-Factor 1	Mentor-Factor 2
1		.69
2		.67
3		.54
4		.62
5		.65
6		.69
7	.43	
8		.39
9	.08	
10	.64	
11		.29
12	.27	
13	.51	
14	.40	
15	.58	
16		.70
17		.68
18	.47	
19	.44	
20	.60	
21	.56	

Table 6
Rotated Component Loadings for MSRI-mentor

Item #	Mentor-Factor 1	Mentor-Factor 2
22		.57
23		.56
24	.82	
25	.83	
26	.76	

Early career teacher form.

The Early Career Teacher sample (n = 143) was tested for internal consistency using Cronbach's alpha. The MSRI-ECT form has 26 items (α = .94). The MSRI-ECT was found to be highly reliable (26 items; α = .94). A principal components extraction with varimax rotation was performed for a sample of 143 Early Career Teachers, who responded to the 26 items. The one factor solution accounted for 80.7% of the variance in the instrument.

Study II: Mentoring Results

Descriptives. Seventy-three ECTs (ECTs) completed both a beginning of year and end of year induction surveys with matched mentor beginning and end of year surveys (n = 35). The ECTs taught for a minimum of .8 years and a maximum of 2.9 years at the time of spring 2014 (M = 1.34 SD = .65). The majority of respondents were traditionally certified (63.6%; n = 49) while 16.9% (n = 13) entered teaching through Teach for America (TFA) and 13.0% (n = 10) were members in other alternative certification programs. Fifty-four (70.1%) of ECTs self-reported they would be a classroom teacher in five years while six (7.8%) reported they would still like to be working in education in some capacity, and eight (10.4%) reported they would no longer be involved in education. Nine teachers did not respond to this item.

The majority of mentors (n = 17) have worked in Elizabeth Schools for 8-15 years with 34.3% (n = 12) serving in the school system for 16 years or more. Mentors self-reported that they worked with a range of one to 15 ECTs (M = 6.17 SD = 3.91). In addition to serving in the role of mentor, the mentors self-reported also performing in a range of one to seven additional roles (M = 2.70 SD = 1.81) including Staff Developer, Literacy Representative, and Test Coordinator. See Table 7 for mentors' self-report of challenges.

Table 7
Mentor (n = 33) Self-Reported Challenges

	No Challenge % *(N)*	**Minimal Challenge % *(N)***	**Moderate Challenge % *(N)***	**Significant Challenge % *(N)***
General Time Constraints		11.4 (4)	22.9 (8)	60.0 (21)
Building relationships with ECTs	45.7 (16)	34.3 (12)	11.4 (4)	2.9 (1)
Providing feedback to ECTs	31.4 (11)	31.4 (11)	25.7 (9)	5.7 (2)
Observing classrooms of ECTs	11.4 (4)	20.0 (7)	37.1 (13)	22.9 (8)
Working with ECTs whose content/grade level expertise is different from your own	37.1 (13)	22.9 (8)	34.3 (12)	
Inexperience as a mentor	40.0 (14)	42.9 (15)	5.7 (2)	5.7 (2)
Number of ECT you mentor	25.7 (9)	25.7 (9)	31.4 (11)	11.4 (4)
Providing instructional support	42.9 (15)	34.3 (12)	14.3 (5)	2.9 (1)
Providing classroom management support	40.0 (14)	34.3 (12)	17.1 (6)	2.9 (1)
Providing emotional support	42.9 (15)	37.1 (13)	8.6 (3)	5.7 (2)

In the Early Career Teacher Beginning of Year (ECT-BOY) survey, 77.9% (n = 60) of teachers self-reported they knew who their site-based mentor was. In contrast, 74.0% (n = 57) of teachers self-reported they knew who their site-based mentor was in the Early Career Teacher End of Year (ECT-EOY) survey. Fifty-two percent of ECTs (n = 40) reported in the affirmative that "My mentor met my needs as a growing professional". Fourteen (27.5%) ECTs indicated they needed additional support from their site-based mentor. When asked how often they met with site-based mentor, 37.7% (n = 29) ECTs reported they never met with their site-based

mentor compared with 2.9% (n = 1) of mentors who indicated never meeting with his/her ECT. Table 8 compares ECTs' and mentors' responses on shared content areas and grade levels.

Table 8
Comparison of Early Career Teachers' and Mentors' Responses on Shared Content Areas and Grades Levels

	Early Career Teacher (n = 52) % *(N)*	**Mentor (n = 33) % *(N)***
Shared School	67.5 (52)	n/a
Shared Content Area	42.9 (33)	54.3 (19)
Shared Grade Level	44.2 (34)	57.1 (20)

Missing Data

Missing data was imputed using the series mean function in SPSS 20 (IBM). Missing values were imputed to increase the size of the data set and because psmatchit in SPSS 20 (IBM) will not run unless there is no missing data in the entire data set including variables that are not included in the matching. Nominal and ordinal variables were treated as continuous variables to allow for mean replacement for the imputed missing data. See Table 10 provides a comparison of the raw data and imputed data. The Related-Samples Wilcoxon Signed Rank Test was run using SPSS 20 (IBM) to determine if there were differences between the distributions of the two samples. There were no significant differences between the medians of the two samples in any of the outcome variables listed in Table 9.

Table 10
Comparison of Raw Data and Imputed Outcome Data Teacher (*n* = 73)

	Raw Data	**Imputed Data**	
	Missingness % *(N)*	***M (SD)***	***M (SD)***
Plans Next Year RECODED	4.1(3)	1.14 (.51)	1.14 (.52)
Plans 5 Years RECODED	6.8 (5)	1.32 (.68)	1.32 (.66)
Percent Change in Teacher Effectiveness Report (Midyear and Final)	41.1 (30)	0.03 (.16)	0.09 (.28)
MSRI Instructional Practice Post-Test Average	43.8 (32)	2.91 (.89)	2.91 (.67)
MSRI Planning Post-Test Average	53.4 (39)	3.47 (1.01)	3.47 (.73)
MSRI Feedback Post-Test Average	37.0 (27)	3.15 (.91)	3.15 (.71)
MSRI Composite Post-Test Average	49.3 (36)	3.18 (.90)	3.18 (.63)
MSRI Instructional Practice Percent Change	63.0(46)	0.34 (.66)	0.34 (.40)
MSRI Planning Percent Change	54.8 (40)	0.43 (.69)	43.00 (.45)
MSRI Feedback Percent Change	49.3 (36)	0.22 (.59)	0.22 (.42)
MSRI Composite Percent Change	67.1 (49)	0.39 (.70)	0.39 (.40)

Propensity Score Matching

Matching was done using psmatchit3 in SPSS 20 (IBM). A composite variable for mentor support was computed from an array of variables from both the beginning and end of year mentor survey (BOY and EOY) (see Table 10). A variable named Support Helpful was created by averaging the BOY and EOY survey responses for the items listed under the helpful question. A variable named Support Frequency was created by averaging the BOY and EOY survey responses for the items listed under the frequency question. The item "Do you feel supported as a mentor" was averaged from the BOY and EOY to create the SupportYN variable.

The Support Helpful, Support Frequency, and Support YN were averaged to create the Support Overall variable. This was recoded as a dichotomous variable with a cut score of less than one as control (not supported) and greater than and equal to one as treatment (supported). Dichotomous variables are necessary for propensity score analysis. One was chosen as a cut score because with an average of one the mentors indicated that they accessed at least some support or felt supported. Based on this composite variable, 78.1% (n = 57) were in the treatment group (i.e. had mentors that were supported) compared with 21.9% (n = 16), mentors who were not supported. Full matching was done with replacement with a 1:10 ratio. No calipers were used (Stuart, 2011). All 16 control cases were matched and no cases were discarded. The multivariate imbalance measure was .47 before matching and .46 after matching. A Cohen's effect size d was calculated for significant differences in samples: .2 is considered a small imbalance. No covariates exhibited an imbalance with a $d \geq .25$. See Figures 5 and 6 for a comparison of the distributions of the unmatched to the matched propensity scores and Figure 7 for a comparison of the unmatched and matched standardized differences.

Table 10
Variables Used to Calculate Composite Mentor Support Variable

How helpful were the following supports? (Not Helpful….Very Helpful)

- District Mentors
- Mentor Specific Professional Development
- Collaboration (visits with Academic Content Liaisons (ACLs); collaboration with administrators, collaboration with alternative certification programs; using video to observe instruction and provide feedback)
- Systemic Professional Development
- Release time specifically for mentoring

How frequently did you access these supports? (Never….Daily)

- District Mentors
- Mentor Specific Professional Development
- Collaboration (visits with ACLs; collaboration with administrators, collaboration with alternative certification programs; using video to observe instruction and provide feedback)
- Systemic Professional Development
- Release time specifically for mentoring

Do you feel supported as a mentor? (Yes or No)

Note: Items in bold are composite variables.

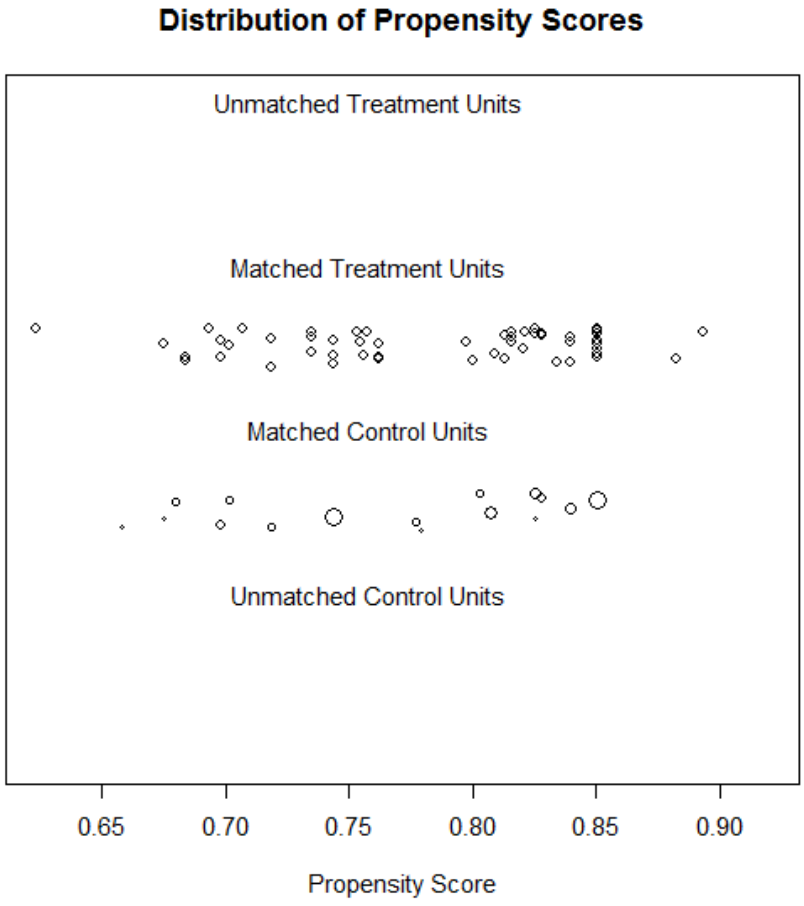

Figure 5. Comparison of Propensity Score distribution between unmatched and matched samples in a jitterplot

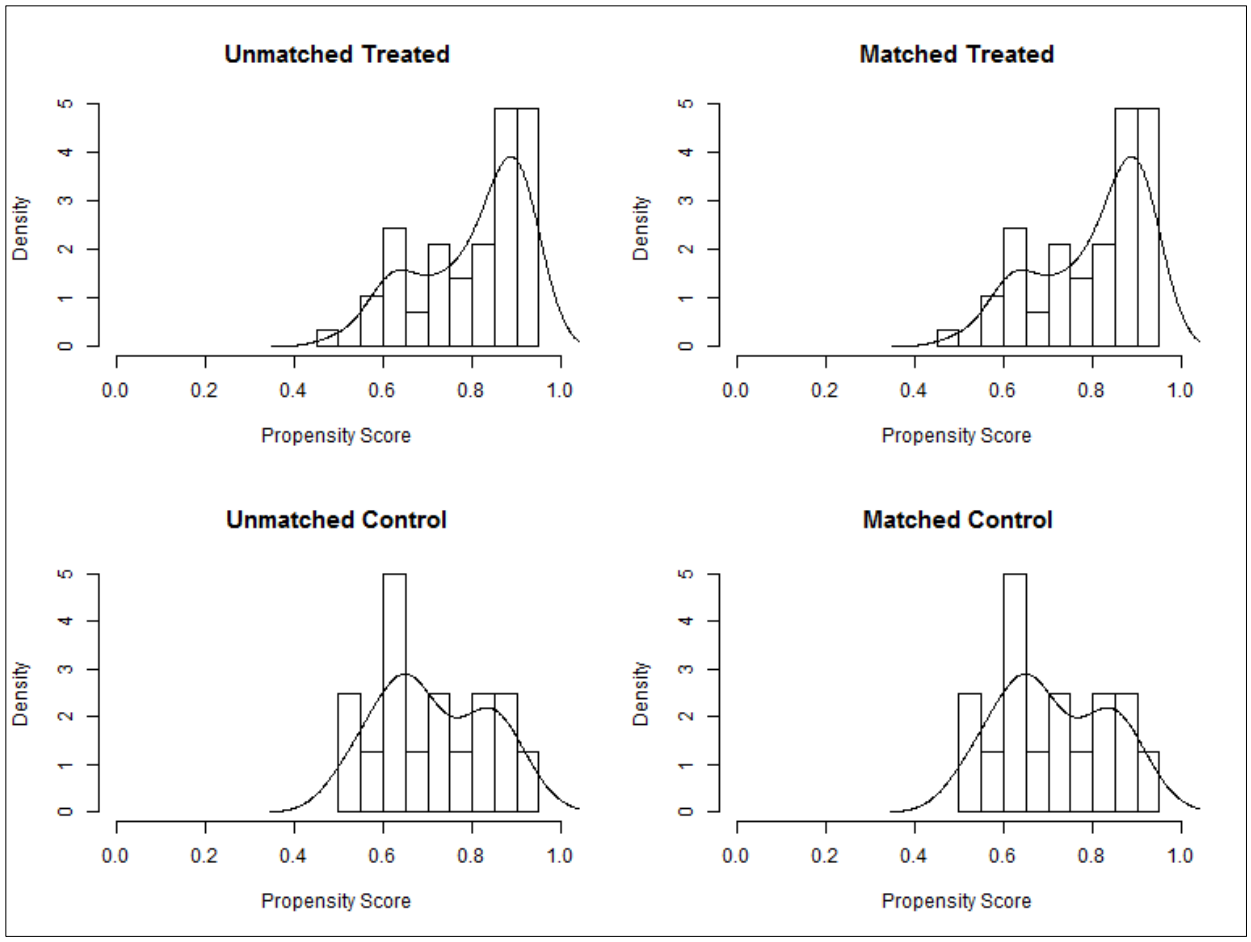

Figure 6. Comparison of Propensity Score distribution in histograms between unmatched and matched samples

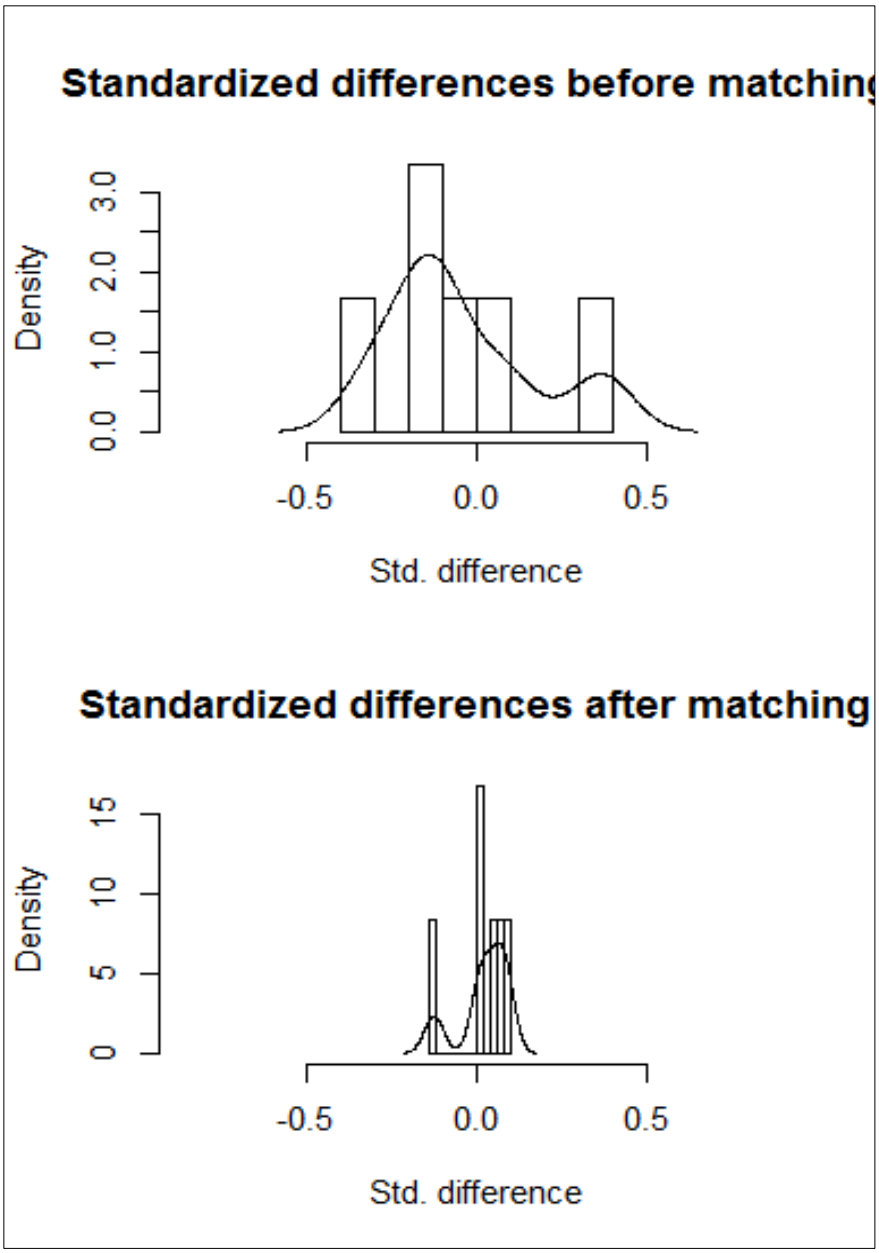

Figure 7. Comparison of standardized differences between unmatched and matched samples

Research Question 1.0

Is there a difference in mentor effectiveness as measured by the Mentor Standard Rating Instrument for school-based mentors by their ECTs depending on level of supportiveness (i.e. helpfulness and frequency of accessing Mentor PD, District Mentors, Collaboration, Release Time, etc.) experienced by mentors?

Research Hypotheses 1.0

a. Early career teachers (ECTs) who have Supported mentors will have a significantly higher MSRI- Instructional Practice Post-Test rating than ECTs who have a NonSupported mentor.
b. ECTS who have Supported mentors will have a significantly higher MSRI-Planning Post-Test rating than ECTs who have a NonSupported mentor.
c. ECTs who have Supported mentors will have a significantly higher MSRI-Feedback Post-Test rating than ECTs who have a mentor.
d. ECTs who have Supported mentors will have a significantly higher MSRI-Composite Post-Test rating than ECTS who have a NonSupported mentor.

A standard linear regression was performed using SPSS 20. MSRI-Instructional Practice, MSRI-Planning, MSRI-Feedback, and MSRI-Composite were each run as separate regressions with the propensity score calculated using the psmatchit program for teachers in the Supported mentor group (treatment) and the NonSupported mentor group (control). The propensity weights generated by the psmatchit program were also included in the regression models. Tables 12 through 15 display the correlations between the variables, unstandardized regression coefficients (β) and intercept, the standardized regression coefficients (*b*), the squared semi-partial correlations (sr^2), R^2, and adjusted R^2. The *R* was not significantly different for any of the MSRI including: Instructional Practice, Planning, Feedback, or Composite between ECTs with Supported and NonSupported mentors. See Table 11 for *F* statistics. This indicates the mentor support did not significantly contribute to scores on the MSRI.

Research hypotheses 1.0.a; 1.0.b.; 1.0.c.; and 1.0.d were not supported.

Table 11

Linear Regression F Statistic for MSRI Hypotheses 1.0.a through 1.0.d

1.0.a	Early career teachers (ECTs) who have Supported mentors will have a significantly higher MSRI- Instructional Practice Post-Test rating than ECTs who have a NonSupported mentor.	F (1,71) = 2.27, p = .14
1.0.b	ECTS who have Supported mentors will have a significantly higher MSRI-Planning Post-Test rating than ECTs who have a NonSupported mentor.	F (1,71) = 1.02, p = .32
1.0.c	ECTs who have Supported mentors will have a significantly higher MSRI-Feedback Post-Test rating than ECTs who have a NonSupported mentor.	F (1,71), 2.37, p = .13
1.0.d	ECTs who have Supported mentors will have a significantly higher MSRI-Composite Post-Test rating than ECTS who have a NonSupported mentor.	F (1,71) = .63, p = .43

Table 12
Standard Linear Regression Results of Propensity Score and MSRI-Instructional Practice (1.0.a)

Variables	MSRI- IP (DV)	Propensity Score	β	b	sr^2
Propensity Score	.176		2.03	.18	
MSRI-Instructional Practice		.18	-.50	-.15	
				Intercept = 1.29	
Means	2.88	.79			
Standard Deviations	.71	.06			
					R^2 = .31
					Adjusted R^2 = .02
					R = .18

Table 13
Standard Linear Regression Results of Propensity Score and MSRI-Planning (1.0.b)

Variables	MSRI- P (DV)	Propensity Score	β	b	sr^2
Propensity Score	.12		1.61	.12	
MSRI-Planning		.12			
				Intercept = 2.16	
Means	3.42	.79			
Standard Deviations	.83	.06			
					R^2 = .01
					Adjusted R^2 = .00
					R = .12

Table 14

Standard Linear Regression Results of Propensity Score and MSRI-Feedback (1.0.c)

Variables	MSRI- F (DV)	Propensity Score	β	b	sr^2
Propensity Score	.18		2.28	1.48	
MSRI-Feedback		.18			
				Intercept = 1.41	
Means	3.11	.79			
Standard Deviations	.79	.06			
					R^2 = .03
					Adjusted R^2 = .02
					R = .18

Table 15

Standard Linear Regression Results of Propensity Score and MSRI-Composite (1.0.d)

Variables	MSRI- CO (DV)	Propensity Score	β	b	sr^2
Propensity Score	.09		1.07	.09	
MSRI-Composite		.18			
				Intercept = 2.30	
Means	3.14	.79			
Standard Deviations	.70	.06			
					R^2 = .01
					Adjusted R^2 = -.01
					R = .09

Research Question 1.1

Are mentor supports accessed (Mentor Academy, Mentor PD, Release time, District Mentors) predictive of changes in Mentor Standards Rating Instrument?

Research Hypotheses 1.1

a. Mentor supports accessed are significantly predictive of changes in the ECTs' ratings of their mentors using the MSRI-Instructional Practice.
b. Mentor supports accessed are significantly predictive of changes in the ECTs' ratings of their mentors using the MSRI-Planning.
c. Mentor supports accessed are significantly predictive of changes in the ECTs' ratings of their mentors using the MSRI-Feedback.
d. Mentor supports accessed are significantly predictive of changes in the ECTs' ratings of their mentors using the MSRI-Composite.

A standard linear regression was performed using SPSS 20. Percent Changes in MSRI-Instructional Practice, MSRI-Planning, MSRI-Feedback, and MSRI-Composite were each run as separate regressions with mentor characteristics, school characteristics, and ECT characteristics controlled for in a stepwise regression model. Mentor supports were identified as the predictive variables of interest. See Table 16 for means and standard deviations of the different variables. In Model 1, the control variables (see Table 16) were entered first. See Table 17 for the correlations of key variables, covariates, and outcomes variables. See Table 18 for the F_{inc} statistics for the Model 1 for hypotheses 1.1.a through 1.1.d. Tables 19 through 22 display the unstandardized regression coefficients (β) and intercept, the standardized regression coefficients (*b*), the squared semi-partial correlations (sr^2), R^2, and adjusted R^2. Model 1 was significant for each of the regressions that were run. In all cases, Model 2 which included the predictor variables of mentor supports was not significant. The only significant variable in the regression

model was the control variable, school mobility. This indicates the mentor support did not significantly contribute to percent changes in the MSRI when controlling for teacher, mentor, and school characteristics.

Research hypotheses 1.1.a; 1.1.b.; 1.1.c. and 1.1.d were not supported.

Table 16
Means and Standard Deviations for Variables Entered into Regression Models

Variable	***M***	***SD***
Dependent Variable		
MSRI—Instructional Practice Percent Change	.34	.40
MSRI—Planning Percent Change	.43	.45
MSRI—Feedback Percent Change	.22	.42
MSRI—Composite Percent Change	.39	.40
Covariates (Model 1 and Model 2)		
School Index	1.03	.13
Mentor EOY—Certification	1.45	.80
Mentor EOY—Number of Mentees	5.64	3.72
Mentor EOY—Pathway	2.45	1.12
Mentor EOY—Number of Roles	2.70	2.31
Mentor EOY—Same Content as Mentees	1.40	.47
Mentor EOY—Same Grade Level as Mentees	1.31	.45
Mentor EOY—Number of Years as Mentor	2.55	1.13
Mentor EOY—Number of Years as Classroom Teacher	4.55	.80
Mentor EOY—Number of Years in Elizabeth Schools	4.34	1.01
Mentor EOY—Number of Years in Education	4.70	.73
School Mobility	45.57	64.86
Percent of Non-Highly Qualified Teachers	23.23	15.09
ECT EOY—Certification	1.49	.78
ECT EOY—Same Content Area as Mentor	1.37	.41
ECT EOY—Network	9.38	4.10

Table 16

Means and Standard Deviations for Variables Entered into Regression Models

Variable	***M***	***SD***
ECT EOY—Role	1.15	.43
ECT EOY—Years in Classroom	1.49	.65
ECT EOY—Years in Education	2.46	1.25
Independent Variables (excluded from Model 1)		
Mentor—Collaboration Support Composite	3.12	.70
Mentor—District Mentor Support	2.71	1.03
Mentor—Mentor Professional Development Support	2.13	.83
Mentor—Release Time Support	3.66	1.19

Table 17

Pearson Correlations of Key Variables, Covariates, and Outcomes

	mobi	Mentor EOY--Certification	Mentor EOY--Number of Teachers	Mentor EOY--Pathway	Mentor EOY--Number of Roles	Mentor EOY--Same Content as Mentees	Mentor EOY--Same Grade Level as Mentees	Mentor EOY--Years as Mentor	Mentor EOY--Years in Classroom	Mentor EOY--Years in Elizabeth Schools	Mentor EOY--Years in Education	mobility	Percent of non Highly Qualified Teachers	ECT EOY--Certification	ECT EOY--Same Content Area as Mentor	ECT EOY--Network	ECT EOY--Role	ECT EOY--Teaching Experience	ECT EOY--Years in Education	Mentor Collaboration Support Composite	Mentor District Mentor Support	Mentor Mentor PD Support	Mentor Release Time Supprt	Mentor Frequency of Collaboration Support	Mentor Frequency Mentor-to-Mentor Support	Mentor Frequency Mentor PD Support	Mentor Work Log Number	Mentor Work Log Minutes	ECT MSRI FEEDBACK TOOL SAT. PLANNING	ECT MSRI FEEDBACK	ECT MSRI PLANNING	ECT MSRI Collaboration	MSRI Instructional Practice	MSRI Planning Percent Change	MSRI Feedback Percent Change	MSRI Collaborate Percent Change
School Index	1	-0.011	0.197	-0.194	-0.05	.246*	-0.129	0.023	0.108	-.232*	0.021	0.121	-0.23	0.152	0.192	.278*	-0.049	0.119	-0.045	-0.124	-0.111	0.185	-0.223	0.083	0.012	0.091	0.089	0.106	0.002	0.108	0.076	0.058	0.023	0.026	0.045	0.007
Mentor EOY--Certification	-0.011	1	.338**	0.126	0.196	0.216	0.177	0.202	.372**	-.245*	-.548**	0.002	0.102	0.027	0.057	0.005	0.102	0.033	0.15	.260*	0.084	0.038	0.078	-.436**	0.007	-0.06	0.073	0.083	0.222	-.243*	-.265*	0.219	0.018	0.018	0.002	0.039
Mentor EOY--Number of Teachers	0.197	.338**	1	0.186	0.227	.573**	0.113	-.288*	-0.216	.395**	.329**	-0.19	0.036	0.042	.299*	.289*	0.081	0.133	0.101	-0.057	0.089	0.034	-0.186	0.086	0.181	0.224	0.253	0.256	0.055	-0.03	0.021	0.049	0.023	0.134	-0.08	0.054
Mentor EOY--Pathway	0.194	-0.126	0.186	1	0.209	0.187	0.197	0.049	.394**	.463**	.383**	0.098	0.045	-0.02	0.128	0.089	0.172	0.052	0.056	0.225	-0.091	0.226	-0.017	.265*	.244*	0.104	0.138	0.129	0.219	0.105	0.076	0.111	0.093	0.012	0.072	0.063
Mentor EOY--Number of Roles	-0.05	-0.196	0.227	0.209	1	0.221	0.077	.369**	0.146	0.032	0.114	0.063	0.001	0.009	0.162	-0.07	0.069	0.159	0.078	-.254*	0.037	-0.03	0.178	0.142	0.039	0.195	0.235	0.241	0.026	0.001	0.023	0.007	0.053	0.052	0.045	-0.03
Mentor EOY--Same Content as Mentees	.246*	0.216	.573**	0.187	0.221	1	0.166	-.356**	-.246*	-.445**	-.321**	0.225	0.172	0.176	0.227	.267*	0.062	0.104	0.05	0.205	0.214	0.125	-0.179	0.011	0.067	0.093	0.152	0.175	0.055	0.054	0.114	0.133	0.084	0.206	0.147	0.134
Mentor EOY--Same Grade Level as Mentees	0.129	0.177	0.113	0.197	0.077	0.166	1	-0.08	-0.074	-.253*	-.245*	0.154	.462**	0.026	0.038	0.138	0.085	-.256*	0.119	-0.059	0.159	-0.13	-0.118	0.177	0.017	0.06	0.178	0.232	0.062	0.008	-0.03	0.03	0.088	0.038	0.07	0.019
Mentor EOY--Years as Mentor	0.023	-0.202	-.288*	0.049	.369**	-.356**	-0.08	1	.479**	.547**	.495**	0.094	0.138	0.117	0.063	0.133	0.158	0.057	0.113	-.238*	-.264*	0.023	0.183	0.122	0.048	-.254*	0.137	-0.14	0.041	0.05	0.009	0.026	0.072	0.056	0.055	0.024
Mentor EOY--Years in Classroom	0.108	.372**	0.216	.394**	0.146	-.246*	0.074	.479**	1	.600**	.890**	0.149	0.133	0.054	0.054	.294*	0.059	0.08	0.195	0.157	0.044	-.244*	-0.023	.253*	0.025	.397**	0.114	0.098	0.225	0.188	0.199	0.148	0.023	0.024	0.045	0.021
Mentor EOY--Years in Elizabeth Schools	-.232*	-.245*	-.395**	.463**	0.032	-.445**	-.253*	.547**	.600**	1	.661**	0.013	-.234*	0.129	0.206	0.001	0.113	0.057	0.167	0.179	-0.14	0.003	0.125	0.069	0.1	0.153	0.011	0.01	0.142	0.143	0.12	0.079	0.042	0.043	0.027	0.011
Mentor EOY--Years in Education	0.021	.548**	.329**	.383**	0.114	-.321**	-.245*	.495**	.890**	.661**	1	0.198	0.098	0.004	0.134	0.187	0.046	0.173	0.179	0.148	-0.073	0.189	0.041	.261*	0.045	-.321**	-0.09	0.093	0.18	0.178	0.18	0.119	0.106	0.029	0.104	0.096
mobility	0.121	0.002	-0.19	0.098	0.063	0.225	0.154	0.094	-0.149	0.013	-0.198	1	0.011	0.11	0.103	0.043	0.083	0.107	0.041	-0.215	0.049	0.066	0.068	0.211	0.152	0.017	0.135	0.171	0.096	0.072	0.073	0.086	.555**	.581**	.561**	.598**
Percent of non Highly Qualified Teachers	-0.23	0.102	0.036	0.045	0.001	0.172	.462**	0.138	-0.133	-.234*	-0.098	0.011	1	0.044	0.026	0.023	0.074	0.011	0.193	0.192	.271*	-.275*	-0.062	0.108	0.031	0.023	0.009	0.055	0.01	0.029	0.092	0.051	0.049	0.087	0.087	0.053
ECT EOY--Certification	0.152	-0.027	0.042	-0.02	0.009	0.176	0.026	0.117	0.054	0.129	0.004	0.11	0.044	1	0.081	0.073	0.008	0.021	-.293*	-0.218	-.246*	0.109	-0.039	0.153	0.026	0.224	0.072	0.074	0.019	0.017	0.088	0.097	0.164	0.112	0.073	0.115
ECT EOY--Same Content Area as Mentor	0.192	0.057	.299*	0.128	0.162	0.227	0.038	0.063	-0.054	0.206	-0.134	0.103	0.026	0.081	1	.304**	0.093	0.022	0.01	0.018	0.069	0.018	0.011	0.058	0.042	0.025	0.158	0.168	0.182	0.101	0.157	0.157	0.061	0.229	0.097	0.094
ECT EOY--Network	.278*	-0.005	.289*	0.089	-0.07	.267*	0.138	0.133	.294*	0.001	0.187	0.043	0.023	0.073	.304**	1	0.168	0.221	0.042	.359**	.245*	0.086	.250*	.244*	0.106	0.085	0.264	0.292	0.106	0.167	0.182	0.14	0.089	0.042	0.037	0.088
ECT EOY--Role	0.049	-0.102	0.081	0.172	0.069	0.062	0.085	0.158	0.059	0.113	0.046	0.083	0.074	0.008	0.093	0.168	1	0.04	0.001	0.067	0.039	0.038	-0.08	0.2	0.101	0.199	0.106	0.103	0.094	0.12	0.049	0.067	0.032	0.089	0.084	0
ECT EOY--Teaching Experience	0.119	0.033	0.133	0.052	0.159	0.104	-.256*	0.057	0.08	0.057	0.173	0.107	0.011	0.021	0.022	0.221	0.04	1	.284*	.276*	-0.027	0.038	0.219	-0.08	0.055	0.082	0.055	0.056	0.127	-0.05	0.049	0.068	0.156	0.212	.250*	0.188
ECT EOY--Years in Education	-0.045	0.15	0.101	0.056	0.078	0.05	0.119	0.113	-0.195	0.167	-0.179	0.041	0.193	-.293*	0.01	0.042	0.001	.284*	1	0.068	0.03	0	-0.063	0.036	0.228	0.014	0.067	-0.05	0.109	0.067	0.043	0.001	0.042	0.021	0.025	0.037
Mentor Collaboration Support Composite	0.124	.260*	0.057	0.225	-.254*	0.205	0.059	-.238*	0.157	0.179	0.148	0.215	0.192	0.218	0.018	.359**	0.067	.276*	0.068	1	.324**	0.111	.402**	0.153	0.084	.378**	0.229	0.241	0.003	0.067	0.026	0.033	-0.21	0.078	0.054	0.129
Mentor District Mentor Support	0.111	0.084	0.089	0.091	0.037	0.214	0.159	-.264*	0.044	-0.14	-0.073	0.049	.271*	-.246*	0.069	.245*	0.039	0.027	0.03	.324**	1	0.165	0.186	0	-.648**	-.491**	0.099	0.063	0.04	0.087	0.093	0.065	0.063	0.096	0.126	0.112
Mentor Mentor PD Support	0.185	0.038	0.034	0.226	-0.03	0.125	-0.13	0.023	-.244*	0.003	-0.189	0.066	-.275*	0.109	0.018	0.086	0.038	0.038	0	0.111	0.165	1	.423**	-.291*	-.263*	0.004	0.156	0.204	0.214	0.174	0.193	-.259*	0.088	0.173	0.142	0.106
Mentor Release Time Supprt	0.223	0.078	0.186	0.017	0.178	0.179	0.118	0.183	-0.023	0.125	0.041	0.068	0.062	0.039	0.011	.250*	-0.08	0.219	0.063	.402**	0.186	.423**	1	-.295*	-.296*	-.398**	0.041	0.066	0.113	0.026	0.082	0.174	0.062	0.065	0.122	0.028

Table 17

Pearson Correlations of Key Variables, Covariates, and Outcomes

	mdoh	Mentor EOY - Certification	Mentor EOY - Number of Teachers	Mentor EOY - Pub+wg	Mentor EOY - Number of Mtrs	Mentor EOY - State Consent in Mentors	Mentor EOY - Highest Level in Mentors	Mentor EOY - Years in Mentors	Mentor EOY - Years in Classroom	Mentor EOY - Years Elizabeth Schools	Mentor EOY - Years in Education	mobility	Percent of core Highly Qualified Teachers	ECT EOY - Certification	ECT EOY - Grade Taught Mentored	ECT EOY - Network	ECT EOY - ELA	ECT EOY - Math Experience	ECT EOY - Years in Education	Mentor Collaboration Support Composite	Mentor District Support	Mentor Mentor PD Support	Mentor Release Time Suppor	Mentor Frequency of Collaboration Support	Mentor Frequency Observe+Debrief Mentor Support	Mentor Frequency Observation Support	Mentor Work Log Number	Mentor Work Log Time minutes	ECT MSRI INSTRUCTIONAL PRACTICE	ECT MSRI FEEDBACK	ECT MSRI PLANNING	ECT MSRI COMPOSITE	MSRI Instructional Percent	MSRI Planning Percent Change	MSRI Feedback Percent Change	MSRI Composite Percent Change
Mentor Frequency of Collaboration Support	0.083	-.436**	0.086	.265*	-0.142	0.011	0.177	0.122	.253*	0.069	.261*	0.211	0.108	-0.153	0.058	.244*	0.2	-0.08	0.036	0.153	0	-.291**	-.295**	1	0.184	0.009	0.307	0.322	0.176	0.138	0.173	0.186	0.098	0.081	0.109	-0.077
Mentor Frequency District Mentor Support	-0.012	0.007	0.181	.244*	0.039	-0.067	0.017	0.048	0.025	0.1	0.045	0.152	0.031	-0.026	0.042	0.106	0.101	0.055	0.228	0.084	-.648**	-.263*	-.296*	0.184	1	-.349**	0.132	0.108	0.062	0.157	0.131	0.087	0.126	0.191	0.224	0.203
Mentor Frequency Mentor PD Support	0.091	-0.06	0.224	0.104	0.195	0.093	0.06	-.254*	-.397**	0.153	-.321**	0.017	0.023	0.224	0.025	0.085	0.199	0.082	0.014	-.378**	-.491**	0.004	-.398**	0.009	-.349**	1	0.065	0.056	0.014	-0.05	0.037	0.071	0.084	0.025	0.008	0.061
Mentor Work Log Number	-0.089	0.073	-0.253	0.138	-0.235	0.152	0.178	0.137	0.114	0.011	-0.09	0.135	0.009	0.072	0.158	0.264	0.106	0.055	0.067	0.229	0.099	0.156	0.041	0.307	0.132	0.065	1	.981**	0.203	0.143	0.152	0.186	0.008	0.193	-0.06	0.061
Mentor Work Log Time minutes	-0.106	0.083	-0.256	0.129	-0.241	0.175	0.232	-0.14	0.098	0.01	0.093	0.171	0.055	0.074	0.168	0.292	0.103	0.056	-0.05	0.241	0.063	0.204	0.066	0.322	0.108	0.056	.981**	1	0.224	0.179	0.187	0.209	0.024	0.166	0.024	-0.02
ECT MSRI INSTRUCTIONAL PRACTICR	0.002	0.222	-0.055	0.219	0.026	0.055	0.062	0.041	0.225	0.142	0.18	0.096	0.01	0.019	0.182	0.106	0.094	0.127	0.109	0.003	0.04	0.214	0.113	0.176	0.062	0.014	0.203	0.224	1	.862**	.771**	.867**	0.228	0.219	0.229	0.211
ECT MSRI FEEDBACK	0.108	-.243*	-0.03	0.105	0.001	0.054	0.008	0.05	0.188	0.143	0.178	0.072	0.029	-0.017	0.101	0.167	0.12	-0.05	0.067	0.067	0.087	0.174	0.026	0.138	0.157	-0.05	0.143	0.179	.862**	1	.866**	.857**	0.132	0.16	0.208	0.185
ECT MSRI PLANNING	0.076	-.265*	0.021	0.076	0.023	0.114	-0.03	0.009	0.199	0.12	0.18	0.073	0.092	-0.088	0.157	0.182	0.049	0.049	0.043	0.026	0.093	0.193	0.082	0.173	0.131	0.037	0.152	0.187	.771**	.866**	1	.939**	0.127	0.206	0.217	0.188
ECT MSRI COMPOSITE	0.058	0.219	0.049	0.111	0.007	0.133	0.03	0.026	0.148	0.079	0.119	0.086	0.051	-0.097	0.157	0.14	0.067	0.068	0.001	0.033	0.065	-.259*	0.174	0.186	0.087	0.071	0.186	0.209	.867**	.857**	.939**	1	0.162	0.22	.248*	0.219
MSRI Instructional Practice Percent Change	0.023	-0.018	0.023	0.093	0.053	-0.084	0.088	0.072	0.023	0.042	0.106	-.555**	0.049	0.164	-0.061	0.089	0.032	0.156	0.042	-0.21	0.063	0.088	0.062	0.098	0.126	0.084	0.008	0.024	0.228	0.132	0.127	0.162	1	.868**	.854**	.920**
MSRI Planning Percent Change	-0.026	0.018	-0.134	0.012	0.052	-0.206	0.038	0.056	0.024	0.043	0.029	-.581**	0.087	0.112	-0.229	0.042	0.089	0.212	0.021	0.078	0.096	0.173	0.065	0.081	0.191	0.025	0.194	0.166	0.219	0.16	0.206	0.22	.868**	1	.942**	.939**
MSRI Feedback Percent Change	0.045	0.002	-0.083	0.072	0.045	-0.147	0.07	0.055	0.045	0.027	0.104	-.561**	0.087	0.073	-0.097	0.037	0.084	.250*	0.025	0.054	0.126	0.142	0.122	0.109	0.224	0.008	-0.06	0.024	0.229	0.208	0.217	.248*	.854**	.942**	1	.939**
MSRI Composite Percent Change	0.007	0.039	-0.054	0.063	-0.033	0.134	0.019	0.024	0.021	0.011	0.096	-.598**	0.053	0.115	-0.094	0.088	0	0.188	0.037	0.129	0.112	0.106	0.028	0.077	0.203	0.061	0.061	-0.02	0.211	0.185	0.188	0.219	.920**	.939**	.939**	1

**$p < .001$; *$p < .05$

Table 18

Linear Regression F Statistic for Percent Change in MSRI Hypotheses 1.1.a through 1.1.d

1.1.a	Mentor supports accessed are significantly predictive of changes in the ECTs' ratings of their mentors using the MSRI-Instructional Practice.	$F_{inc}(19,53) = 2.235,\ p < .05$
1.1.b	Mentor supports accessed are significantly predictive of changes in the ECTs' ratings of their mentors using the MSRI-Planning.	$F_{inc}(19,53) = 2.235,\ p < .05$
1.1.c	Mentor supports accessed are significantly predictive of changes in the ECTs' ratings of their mentors using the MSRI-Feedback.	$F_{inc}(19,53) = 2.256,\ p < .05$
1.1.d	Mentor supports accessed are significantly predictive of changes in the ECTs' ratings of their mentors using the MSRI-Composite.	$F_{inc}(19,53) = 2.293,\ p < .01$

Table 19
Sequential Linear Regression Results for Percent Change on MSRI-Instructional Practice – Model 1 (1.1.a)

Variables	β	b	sr^2
School Index	.05	.02	
Mentor EOY—Certification	-.11	-.23	
Mentor EOY—Number of Teachers	.01	.11	
Mentor EOY—Pathway	-.01	-.03	
Mentor EOY—Number of Roles	-.00	-.01	
Mentor EOY—Same Content as Mentees	-.03	-.03	
Mentor EOY—Same Grade Level as Mentees	.12	.13	
Mentor EOY—Years as Mentor	.04	.13	
Mentor EOY—Years in Classroom	.27	.55	
Mentor EOY—Years in Elizabeth Schools	.01	.02	
Mobility	-.39*	-.71	.12
Percent of Non-Highly Qualified Teachers	.00	.47	
ECT EOY—Certification	.00	.07	
ECT EOY—Same Content Area as Mentor	.02	.05	
ECT EOY—Network	-.13	-.13	
ECT EOY—Role	.01	.08	
ECT EOY—Teaching Experience	.01	.07	
ECT EOY—Years in Education	.15	.24	
		Intercept = 5.08	
	R^2 = .01[a] Adjusted R^2 = .25* R = .67		

*$p < .05$
** $p < .001$
[a]unique variability = .12; shared variability = .01

Table 20

Sequential Linear Regression Results for Percent Change on MSRI-Planning –Model 1(1.1.b)

Variables	*β*	*b*	sr^2
School Index	.28	.08	
Mentor EOY—Certification	-.07	-.12	
Mentor EOY—Number of Teachers	.02	.13	
Mentor EOY—Pathway	.01	.01	
Mentor EOY—Number of Roles	.00	.02	
Mentor EOY—Same Content as Mentees	-.13	-.13	
Mentor EOY—Same Grade Level as Mentees	.04	.04	
Mentor EOY—Years as Mentor	.01	.03	
Mentor EOY—Years in Classroom	.16	.28	
Mentor EOY—Years in Elizabeth Schools	.03	.07	
Mobility	-.23**	-.37	.14
Percent of Non-Highly Qualified Teachers	.00	.51	
ECT EOY—Certification	.00	.15	
ECT EOY—Same Content Area as Mentor	-.01	-.01	
ECT EOY—Network	-.13	-.25	
ECT EOY—Role	.01	.08	
ECT EOY—Teaching Experience	.01	-.05	
ECT EOY—Years in Education	.15	.20	
		Intercept = 5.08	
	$R^2 = .45^a$ Adjusted $R^2 = .25$* R = .67		

*$p < .05$

** $p < .001$

[a]unique variability = .14; shared variability = .31

Table 21

Sequential Linear Regression Results for Percent Change on MSRI-Feedback –Model 1(1.1.c)

Variables	*β*	*b*	sr^2
School Index	.57	.18	
Mentor EOY—Certification	-.07	-.14	
Mentor EOY—Number of Teachers	.07	.14	
Mentor EOY—Pathway	.00	.00	
Mentor EOY—Number of Roles	.01	.08	
Mentor EOY—Same Content as Mentees	-.10	-.11	
Mentor EOY—Same Grade Level as Mentees	.23	.25	
Mentor EOY—Years as Mentor	.01	.03	
Mentor EOY—Years in Classroom	.04	.07	
Mentor EOY—Years in Elizabeth Schools	.06	.15	
Mobility	-.16**	-.27	.16
Percent of Non-Highly Qualified Teachers	.00	.54	
ECT EOY—Certification	.00	.08	
ECT EOY—Same Content Area as Mentor	-.04	-.07	
ECT EOY—Network	-.14	-.14	
ECT EOY—Role	.01	.05	
ECT EOY—Teaching Experience	-.03	-.03	
ECT EOY—Years in Education	.20	.30	
		Intercept = .-.50	
	R^2 = .45[a] Adjusted R^2 = .25* R = .67		

* $p < .05$

** $p < .001$

[a]unique variability = .16; shared variability = .29

Table 22

Sequential Linear Regression Results for Percent Change on MSRI-Composite –Model 1 (1.1.d)

Variables	*β*	*b*	sr^2
School Index	.29	.10	
Mentor EOY—Certification	-.08	-.16	
Mentor EOY—Number of Teachers	.02	.17	
Mentor EOY—Pathway	-.02	-.05	
Mentor EOY—Number of Roles	.02	.10	
Mentor EOY—Same Content as Mentees	-.07	-.08	
Mentor EOY—Same Grade Level as Mentees	.14	.16	
Mentor EOY—Years as Mentor	-.02	-.05	
Mentor EOY—Years in Classroom	.09	.19	
Mentor EOY—Years in Elizabeth Schools	.06	.15	
Mobility	-.16**	-.29	.19
Percent of Non-Highly Qualified Teachers	.00	.60	
ECT EOY—Certification	.00	.06	
ECT EOY—Same Content Area as Mentor	.006	.01	
ECT EOY—Network	-.13	-.13	
ECT EOY—Role	.01	.08	
ECT EOY—Teaching Experience	.03	.03	
ECT EOY—Years in Education	.12	.19	
		Intercept = -.22	
	R^2 = .45[a]		
	Adjusted R^2 = .25*		
	R = .67		

* $p < .05$

** $p < .001$

[a]unique variability = .19; shared variability = .26

Research Question 2.0

Is there a difference in Mentor Work Log Activity (i.e. time in total minutes and frequency in total number of entries by their ECTs depending on level of supportiveness (i.e. helpfulness and frequency of accessing Mentor PD, District Mentors, Collaboration, Release Time, etc.) experienced by mentors?

Research Hypotheses 2.0

a. Early career teachers (ECTs) who have Supported mentors will have a significantly higher time in minutes of Mentor Work Log Activity than ECTs who have a NonSupported mentor.
b. ECTs who have Supported mentors will have a significantly higher number of Mentor Log entries than ECTs who have a NonSupported mentor.

A standard linear regression was performed using SPSS 20. Mentor Work Log Activity –Time in Minutes and Mentor Work Log Activity –Number of Entries were each run as separate regressions with the propensity score calculated using the psmatchit program for teachers in the Supported mentor group (treatment) and the NonSupported mentor group (control). The propensity weights generated by the psmatchit program were also included in the regression models. See Table 23 for *F* statistics. This indicates the mentor support did not significantly contribute to Mentor Work Log Activity. Tables 24 through 25 display the correlations between the variables, unstandardized regression coefficients (β) and intercept, the standardized regression coefficients (*b*), the squared semi-partial correlations (sr^2), R^2, and adjusted R^2. The R was not significantly different for the Mentor Work Log Activity Time in Minutes or Work Log Activity Number of Entries between ECTs with Supported and NonSupported mentors.

Research hypotheses 2.0.a and 2.0.b were not supported.

Table 23

Linear Regression F Statistic for Work Log Activity 2.0.a and 2.0.b

2.0.a	Early career teachers (ECTs) who have Supported mentors will have a significantly higher time in minutes of Mentor Work Log Activity than ECTs who have a NonSupported mentor.	F (1,34) = .38, p = .54
2.0.b	ECTs who have Supported mentors will have a significantly higher number of Mentor Log entries than ECTs who have a NonSupported mentor.	F (1,33) = .24, p = .63

Table 24

Standard Linear Regression Results of Propensity Score and Mentor Work Log (MWL) Activity – Time in Minutes (2.0.a)

Variables	MWL-Time (DV)	Propensity Score	β	b	sr^2
Propensity Score	.09		289.14	.09	
MWL- Time		.09			
				Intercept =	12314.57
Means	110.80	.79			
Standard Deviations	.78	.06			
					R^2 = -.02
					Adjusted R^2 = -.02
					R = .09

Table 25
Standard Linear Regression Results of Propensity Score and Mentor Work Log Activity (MWL-E) –Entries (2.0.b)

Variables	MWL-E(DV)	Propensity Score	β	b	sr^2
Propensity Score	.11		6.71	.11	
MWL-Entries		.11			
				Intercept = 6.69	
Means	2.62	.79			
Standard Deviations	.79	.06			
					R^2 = .01
					Adjusted R^2 = -.02
					R = .11

Research Question 2.1

Are mentor supports accessed (Mentor Academy, Mentor PD, Release time, District Mentors) predictive of Mentor Work Log activity?

Research Hypotheses 2.1

a. Mentor supports are significantly predictive of Mentor Work Log Activities –Time in Minutes.

b. Mentor supports are significantly predictive of Mentor Work Log Activities – Number of Entries.

A standard linear regression was performed using SPSS 20. Mentor Work Log Activity – Time in Minutes and Mentor Work Log Activity –Number of Entries were each run as separate regressions with mentor characteristics, school characteristics, and ECT characteristics controlled for in a stepwise regression model. Mentor supports were identified as the predictive variables of interest. See Table 27 for means and standard deviations of the different variables and Table 18 for the correlations of the variables of interest. Tables 29 and 30 display the

unstandardized regression coefficients (β) and intercept, the standardized regression coefficients (*b*), the squared semi-partial correlations (sr^2), R^2, and adjusted R^2. Neither Model 1 nor Model 2 were significant for each of the regressions that were run. In Model 1, the control variables (see Table 26) were entered first. In Model 2, the control variables were entered in block 1 and the predictor variables were entered in block 2. Although there was no significance Model 2 had a better fit as is evident by the *F* statistic (see Table 27). No variables in either Model 1 or Model 2 were predictive of Mentor Work Log Activity.

Research hypotheses 2.1.a and 2.1.b were not supported.

Table 26
Standard Deviations and Means of Variables in Regression Models

Variable (*n* = 35)	***M***	***SD***
Dependent Variable		
Mentor Work Log—Time in Minutes	108.80	.78
Mentor Work Log—Number of Entries	2.58	.12
Covariates (Model 1 and Model 2)		
School Index	1.02	.12
Mentor EOY—Certification	1.37	.76
Mentor EOY—Number of Teachers	5.47	3.64
Mentor EOY—Pathway	2.54	1.07
Mentor EOY—Number of Roles	3.51	2.83
Mentor EOY—Same Content as Mentees	1.37	.47
Mentor EOY—Same Grade Level as Mentees	1.33	.46
Mentor EOY—Years as Mentor	2.55	1.14
Mentor EOY—Years in Classroom	4.57	.81
Mentor EOY—Years in Elizabeth Schools	4.31	1.12
Mentor EOY—Years in Education	4.78	.72
Mobility	38.28	15.09
Percent of Non-Highly Qualified Teachers	24.85	16.95
ECT EOY—Certification	1.46	.74
ECT EOY—Same Content Area as Mentor	1.31	.41
ECT EOY—Network	8.94	4.64
ECT EOY—Role	1.12	.32
ECT EOY—Teaching Experience	1.29	.57
ECT EOY—Years in Education	2.43	1.4

Table 26

Standard Deviations and Means of Variables in Regression Models

Variable (*n* = 35)	***M***	***SD***
Mentor Collaboration Support Composite	3.03	.69
Mentor District Mentor Support	2.97	1.15
Mentor Mentor PD Support	2.25	.80
Mentor Release Time Support	3.72	1.20

Table 27

Linear Regression F Statistic for Mentor Supports Predictive of Mentor Work Log Activities 2.1.a through 2.1.b

2.1.a	Mentor supports are significantly predictive of Mentor Work Log Activities –Time in Minutes.	$F_{inc}(4,11) = 1.82, p = .20$
2.1.b	Mentor supports are significantly predictive of Mentor Work Log Activities – Number of Entries.	$F_{inc}(4,12) = 1.28, p = .33$

Table 28
Sequential Linear Regression Results for Mentor Supports Accessed on Mentor Work Log –Time in Minutes –Model 2 (2.1.a)

Variables	*β*	*b*	sr^2
School Index	-406.38	-.22	
Mentor EOY—Certification	-274.52	-.93	
Mentor EOY—Number of Teachers	15.79	.26	
Mentor EOY—Pathway	-142.62	-.68	
Mentor EOY—Number of Roles	19.81	.25	
Mentor EOY—Same Content as Mentees	222.85	.47	
Mentor EOY—Same Grade Level as Mentees	-73.67	-.15	
Mentor EOY—Years as Mentor	-121.08	-.62	
Mentor EOY—Years in Classroom	342.43	1.23	
Mentor EOY—Years in Elizabeth Schools	213.68	1.07	
Mobility	-498.11	-1.60	
Percent of Non-Highly Qualified Teachers	-6.76	-.46	
ECT EOY—Certification	-1.22	-.09	
ECT EOY—Same Content Area as Mentor	79.58	.26	
ECT EOY—Network	-178.00	-.32	
ECT EOY—Role	-27.25	-.56	
ECT EOY—Teaching Experience	-269.85	-.39	
ECT EOY—Years in Education	126.94	.32	
Mentor Collaboration Support Composite	-4.11	-.03	
Mentor District Mentor Support	198.09	.61	
Mentor PD Support	13.79	.07	
Mentor Release Time Support	14.32	.05	
		Intercept = -.861.17	
		R^2 = .76[a] Adjusted R^2 = .24 R = .87	

Table 29
Sequential Linear Regression Results for Mentor Supports Accessed on Mentor Work Log – Number of Entries –Model 2 (2.1.b)

Variables	β	b	sr^2
School Index	-4.23	-.12	
Mentor EOY—Certification	-5.10	-.93	
Mentor EOY—Number of Teachers	.38	.33	
Mentor EOY—Pathway	-3.68	-.94	
Mentor EOY—Number of Roles	.54	.37	
Mentor EOY—Same Content as Mentees	2.26	.26	
Mentor EOY—Same Grade Level as Mentees	-4.91	-.55	
Mentor EOY—Years as Mentor	-2.63	-.73	
Mentor EOY—Years in Classroom	6.99	1.35	
Mentor EOY—Years in Elizabeth Schools	4.98	1.34	
Mobility	-11.52	-1.97	
Percent of Non-Highly Qualified Teachers	-.17	-.61	
ECT EOY—Certification	-.02	-.08	
ECT EOY—Same Content Area as Mentor	2.38	.42	
ECT EOY—Network	-2.42	-.24	
ECT EOY—Role	-.51	-.56	
ECT EOY—Teaching Experience	-6.17	-.47	
ECT EOY—Years in Education	.77	.11	
Mentor Collaboration Support Composite	.23	.08	
Mentor District Mentor Support	4.85	.80	
Mentor PD Support	.56	.16	
Mentor Release Time Support	-.67	-.14	
	Intercept = 30.47		
	R^2 = .636[a] Adjusted R^2 = -.063 R = .797		

Research Question 3.0

What is the relationship between school-based mentoring and Early Career Teacher Outcomes (i.e. self-reported retention, improved practice, and future career plans)?

Research Hypotheses 3.0

a. The quality of school-based mentoring as measured by the MSRI will be a significant predictor of self-reported ECT retention after one year controlling for teacher, mentor, and school characteristics.
b. The quality of school-based mentoring as measured by the MSRI will be a significant predictor of improved practice as measured by percent change in Teacher Effectiveness Rating controlling for teacher, mentor, and school characteristics.
c. The quality of school-based mentoring as measured by the MSRI will be a significant predictor of self-reported ECT 5 year future career plans in education controlling for teacher, mentor, and school characteristics.

MSRI- one year.

A binary logistic regression was performed using SPSS 20. The outcome of interest was the self-report of ECTs (n = 73) continuing in the field of education after one year controlling for teacher, mentor, and school characteristic. This logistic regression would not run because it was unable to estimate a model. It cannot be determined if school-based mentoring as measured by the MSRI will be a significant predictor of self-reported ECT retention after one year controlling for teacher, mentor, and school characteristics.

Research hypothesis 3.0.a was not supported.

MSRI-teacher effectiveness rating.

A standard linear regression was performed using SPSS 20. The outcome of interest was the percent change in ECT Teacher Effectiveness rating (n = 73). The regression model examined if the MSRI predicted percent change in ECTs' Teacher Effectiveness rating controlling for teacher, mentor, and school characteristic. A stepwise regression was used with the control variables entered in Model 1. See Table 18 for correlations of key variables. Neither Model 1 nor Model 2 were significant in predicting percent change in ECT Teacher Effectiveness Rating. Model 2 which included the covariates and the variables of interest: MSRI-Instructional Practice, MSRI-Planning, and MSRI-Feedback had the largest R^2 change. F_{inc} (4, 49) = 1.18, p = .33. These results indicate there was no predictive relationship between school-based mentoring as measured by the MSRI and the percent change in the ECT Teacher Effectiveness Rating.

Research hypothesis 3.0.b was not supported.

MSRI- five years.

A binary logistic regression was performed using SPSS 20. The outcome of interest was the self-report of ECTs (n = 73) continuing in the field of education after five years controlling for teacher, mentor, and school characteristics. A test of the full model against a constant only model was not significant χ^2 (19, N = 73) = 26.09, p = .13. School-based mentoring as measured by the MSRI-Instructional Practice, MSRI-Planning, and MSRI-Feedback are not a significant predictor of self-reported ECT retention after five years controlling for teacher, mentor, and school characteristics.

Research hypothesis 3.0.c was not supported.

Research Question 3.1

Is there a difference in Early Career Teacher Outcomes depending on the level of supportiveness (i.e. helpfulness and frequency of accessing Mentor PD, District Mentors, Collaboration, Release Time, etc.) experienced by mentors?

Research Hypotheses 3.1

a. There is a significant difference in self-reported ECT retention after one year depending on the level of supportiveness (i.e. helpfulness and frequency of accessing Mentor PD, District Mentors, Collaboration, Release Time, etc.) experienced by mentors.
b. There is a significant difference in percent change in ECT Teacher Effectiveness depending on the level of supportiveness (i.e. helpfulness and frequency of accessing Mentor PD, District Mentors, Collaboration, Release Time, etc.) experienced by mentors.
c. There is a significant difference in self-report ECT retention after five years depending on the level of supportiveness (i.e. helpfulness and frequency of accessing Mentor PD, District Mentors, Collaboration, Release Time, etc.) experienced by mentors.

Supported vs. NonSupported mentor-one year.

A binary logistic regression was performed using SPSS 20. The propensity score calculated using the psmatchit program for teachers in the Supported mentor group (treatment) and the NonSupported mentor group (control) was included as the independent variable and the self-reported ECT retention after one year (1= remain in education; 0= leave education). This logistic regression would not run because it was unable to estimate a model. It cannot be

determined if Supported versus NonSupported mentor was related to ECT retention after one year.

Research hypothesis 3.1.a was not supported.

Supported vs. NonSupported mentor-teacher effectiveness rating.

A standard linear regression was performed using SPSS 20. The propensity score calculated using the psmatchit program for teachers (n = 73) in the Supported mentor group (treatment) and the NonSupported mentor group (control) was included as the independent variable and the percent change in the ECT's Teacher Effectiveness Rating (M = .10 SD = .28) was the dependent variable. The propensity scores and the propensity weights were entered into the model to determine if the propensity score was a predictor of the percent change in Teacher Effectiveness Rating. The regression model was not significant, F (1, 71) = .58, p = .45. The propensity score (the teachers' likelihood of having a mentor that was supported vs. a mentor that was not supported) was not predictive of percent change in Teacher Effectiveness Rating.

Research hypothesis 3.1.b was not supported.

Supported vs. NonSupported- five years.

A binary logistic regression was performed using SPSS 20. The propensity score calculated using the psmatchit program for teachers (n = 73) in the Supported mentor group (treatment) and the NonSupported mentor group (control) was included as the independent variable and the outcome of interest was the self-report of ECTs continuing in the field of education after five years. A test of the full model against a constant only model was not significant χ^2 (1, N = 73) = .083, p = .774. Whether or not a teacher had a Supported or NonSupported mentor was not a significant predictor of self-reported ECT retention after five years.

Research hypothesis 3.1.c was not supported.

Research Question 3.2

Are mentor supports accessed (Mentor Academy, Mentor PD, Release time, District Mentors) predictive of Early Career Teacher Outcomes?

Research Hypotheses 3.2

a. The types of supports accessed by the mentor will be a significant predictor of self-reported ECT retention after one year controlling for teacher, mentor, and school characteristics.
b. The types of supports accessed by the mentor will be a significant predictor of improved practice as measured by percent change in Teacher Effectiveness Rating controlling for teacher, mentor, and school characteristics.
c. The types of supports accessed by the mentor will be a significant predictor of self-reported ECT 5 year future career plans in education controlling for teacher, mentor, and school characteristics.

Mentor supports-one year

A binary logistic regression was performed using SPSS 20. The outcome of interest was the self-report of ECTs (n = 73) continuing in the field of education after one year controlling for teacher, mentor, and school characteristic. This logistic regression would not run because it was unable to estimate a model. It cannot be determined if types of supports accessed by mentors will be a significant predictor of self-reported ECT retention after one year controlling for teacher, mentor, and school characteristics.

Research hypothesis 3.2.a was not supported.

Mentor supports-teacher effectiveness rating.

A standard linear regression was performed using SPSS 20. The outcome of interest was the percent change in ECTs' Teacher Effectiveness rating (n = 73). The regression model examined if the mentor supports accessed predicted percent change in Teacher Effectiveness rating controlling for teacher, mentor, and school characteristics. A stepwise regression was used with the control variables entered in Model 1. See Table 17 for correlations of key variables. Neither Model 1 nor Model 2 were significant in predicting percent change in ECT Teacher Effectiveness Rating. Model 2 which included the covariates and the variables of interest: Support-Collaboration; Support-District Mentor; Support-Mentor PD; Support-Release Time had the largest R^2 change. F_{inc} (24, 72) =. 99, p = .50. These results indicate there was no predictive relationship between supports accessed by mentors and the percent change in the ECTs' Teacher Effectiveness Rating.

Research hypothesis 3.2.b was not supported.

Mentor supports- five years.

A binary logistic regression was performed using SPSS 20. The outcome of interest was the self-report of ECTs (n = 73) continuing in the field of education after five years controlling for teacher, mentor, and school characteristics. A test of the full model against a constant only model was not significant χ^2 (20, N = 73) = 27.47, p = .12. Mentor supports accessed including: Support-Collaboration; Support-District Mentor; Support-Mentor PD; Support-Release Time are not significant predictors of self-reported ECT retention after five years controlling for teacher, mentor, and school characteristics.

Research hypothesis 3.2.c was not supported.

Research Question 3.3

What is the relationship between Mentor Work Log Activity and Early Career Teacher Outcomes?

Research Hypotheses 3.3

a. Mentor Work Log Activity will be a significant predictor of self-reported ECT retention after one year controlling for teacher, mentor, and school characteristics.
b. Mentor Work Log Activity will be a significant predictor of improved practice as measured by percent change in Teacher Effectiveness Rating controlling for teacher, mentor, and school characteristics.
c. Mentor Work Log Activity will be a significant predictor of self-reported ECT 5 year future career plans in education controlling for teacher, mentor, and school characteristics.

Mentor work log activity-one year.

A binary logistic regression was performed using SPSS 20. The outcome of interest was the self-report of ECTs (n = 35) continuing in the field of education after one year controlling for teacher, mentor, and school characteristics. A test of the full model against a constant only model was not significant χ^2 (20, N = 35) = 20.48, p = .429. Mentor Work Log Activity including: Time in Minutes and Number of Entries are not significant predictors of self-reported ECT retention after one year controlling for teacher, mentor, and school characteristics.

Research hypothesis 3.3.a was not supported.

Mentor work log-teacher effectiveness rating.

A standard linear regression was performed using SPSS 20. The outcome of interest was the percent change in ECT Teacher Effectiveness rating (n = 35). The regression model examined if

the Mentor Work Log Activity was predictor of percent changes in ECTs' Teacher Effectiveness rating controlling for teacher, mentor, and school characteristics. A stepwise regression was used with the control variables entered in Model 1. See Table 18 for correlations of key variables. Neither Model 1 nor Model 2 were significant in predicting percent change in ECT Teacher Effectiveness Rating. Model 1 which included only the covariates and did not include the variables of interest: Mentor Work Log-Time in Minutes and Mentor Work Log- Number of Entries had the largest R^2 change. $F_{inc}(20, 14) = 1.06$, $p = .47$. These results indicate there was no predictive relationship between Mentor Work Log Activity and the percent change in the ECTs' Teacher Effectiveness Rating.

Research hypothesis 3.3.b was not supported.

Mentor work log- five years.

A binary logistic regression was performed using SPSS 20. The outcome of interest was the self-report of ECTs ($n = 35$) continuing in the field of education after five years controlling for teacher, mentor, and school characteristics. A test of the full model against a constant only model was significant $\chi^2(20, N = 35) = 35.03$, $p < .05$. The Hosmer and Lemeshow Test is $\chi^2(6, N = 35) = 0$, $p = 1.00$ which indicates the model is a good fit. None of the Wald statistics were significant so it is not clear which if any variables were significant predictors of retention in education after five years. Therefore, there is not enough information to prove that Mentor Log Activity: Time in Minutes and Number of Entries is a significant predictor of self-reported ECT retention after five years controlling for teacher, mentor, and school characteristics.

Research hypothesis 3.3.c was not supported.

Research Question 3.4

What is the relationship between Mentor Type (full release) and Early Career Teacher outcomes?

Research Hypotheses 3.4

a. There is a significant relationship between Mentor Type (full release) and self-reported ECT retention after one year controlling for teacher, mentor, and school characteristics.
b. There is a significant relationship between Mentor Type (full release) and percent change in ECTs' Teacher Effectiveness Rating one year controlling for teacher, mentor, and school characteristics.
c. There is a significant relationship between Mentor Type (full release) and self-reported ECT retention after five years controlling for teacher, mentor, and school characteristics.

Full time mentor-one year.

A binary logistic regression was performed using SPSS 20. The outcome of interest was the self-report of ECTs (n = 73) continuing in the field of education after one year controlling for teacher, mentor, and school characteristics. A test of the full model against a constant only model was not significant χ^2 (1, N = 73) = 0, p = .99. Self-reported full-release mentor (n = 5) was not a significant predictor of self-reported ECT retention after one year controlling for teacher, mentor, and school characteristics.

Research hypothesis 3.4.a was not supported.

Full time mentor-teacher effectiveness rating.

A standard linear regression was performed using SPSS 20. The outcome of interest was the percent change in ECTs' Teacher Effectiveness rating (n = 73). The regression model examined if having a self-reported full-time mentor was a predictor of percent changes in ECTs' Teacher Effectiveness rating controlling for teacher, mentor, and school characteristics. A stepwise

regression was used with the control variables entered in Model 1. See Table 18 for correlations of key variables. Neither Model 1 nor Model 2 were significant in predicting percent change in ECT Teacher Effectiveness Rating. Model 1 which included only the covariates and did not include the variable of interest: full time mentor (n = 5) had the largest R^2 change. F_{inc} (20, 52) = .93, p = .47. These results indicate there was no predictive relationship between full time mentor and percent change in the ECTs' Teacher Effectiveness Rating.

Research hypothesis 3.4.b was not supported.

Full time mentor- five years.

A binary logistic regression was performed using SPSS 20. The outcome of interest was the self-report of ECTs (n = 73) continuing in the field of education after five years controlling for teacher, mentor, and school characteristics. A test of the full model against a constant only model was not significant χ^2 (20, N = 73) = 27.47, p = .12. Self-reported full-release mentor (n = 5) is not a significant predictor of self-reported ECT retention after five years controlling for teacher, mentor, and school characteristics.

Research hypothesis 3.4.c was not supported.

Post Hoc Analyses

The univariate variables of mentor support: ACL, Video Feedback, Alternative Certification, and Administration were used to calculate the Mentor Collaboration Composite Variable (see Table 11). For the purpose of post hoc analyses, these variables were examined individually instead of multivariate. In addition to presenting the means and standard deviations of ECT outcomes, covariates, and univariate mentor support variables, Table 30 indicates the research questions (RQ) that are related to each outcome variable.

Table 30

Means and Standard Deviations of ECT Outcomes (n =73) and Univariate Mentor Supports (n = 35) for Post Hoc Regression Analyses Crosswalked with Research Questions

	M	***SD***	**RQ**
Binary ECT Outcomes			
Plans Next Year RECODED	1.14	.51	3.2.a
Plans 5 Years RECODED	1.32	.68	3.2.c
Continuous ECT Outcomes			
Percent Change in Teacher Effectiveness	.03	.16	3.2.b
Report (Midyear and Final)			
Mentor Work Log Time in Minutes	110.80	.78	2.1.a
Mentor Work Log Entries	2.58	.12	2.1.b
MSRI Instructional Practice Post-Test Average	2.91	.89	1.0.a
MSRI Planning Post-Test Average	3.47	1.01	1.0.b
MSRI Feedback Post-Test Average	3.15	.91	1.0.c
MSRI Composite Post-Test Average	3.18	.90	1.0.d
MSRI Instructional Practice Percent Change	.34	.66	1.1.a
MSRI Planning Percent Change	.43	.69	1.1.b
MSRI Feedback Percent Change	.22	.59	1.1.c
MSRI Composite Percent Change	.39	.70	1.1.d
Univariate Mentor Supports			
Mentor Support ACL	2.58	1.20	
Mentor Support Video	3.74	1.54	
Mentor Support Alternative Certification Program	3.17	1.30	
Mentor Support Administration	3.00	9.14	

Table 30
Means and Standard Deviations of ECT Outcomes (n =73) and Univariate Mentor Supports (n = 35) for Post Hoc Regression Analyses Crosswalked with Research Questions

	M	***SD***	**RQ**
School Index	1.02	.12	
Mentor EOY—Certification	1.37	.76	
Mentor EOY—Number of Teachers	5.47	3.64	
Mentor EOY—Pathway	2.54	1.07	
Mentor EOY—Number of Roles	3.51	2.83	
Mentor EOY—Same Content as Mentees	1.37	.47	
Mentor EOY—Same Grade Level as Mentees	1.33	.46	
Mentor EOY—Years as Mentor	2.55	1.14	
Mentor EOY—Years in Classroom	4.57	.81	
Mentor EOY—Years in Elizabeth Schools	4.31	1.12	
Mentor EOY—Years in Education	4.78	.72	
Mobility	38.28	15.09	
Percent of Non-Highly Qualified Teachers	24.85	16.95	
ECT EOY—Certification	1.46	.74	
ECT EOY—Same Content Area as Mentor	1.31	.41	
ECT EOY—Network	8.94	4.64	
ECT EOY—Role	1.12	.32	
ECT EOY—Teaching Experience	1.29	.57	
ECT EOY—Years in Education	2.43	1.4	

Separate sequential linear regressions were performed using SPSS 20 for each of the continuous ECT outcomes presented in Table 31. The complete model included the propensity score calculated using the psmatchit program for teachers in the Supported mentor group (treatment) and the NonSupported mentor group (control). The propensity weights generated by

the psmatchit program were also included in the regression models. Covariates identified in Table 31 were also included in the complete model. As part of the post hoc analyses, the univariate mentor supports (see Table 30) were run separately as individual models. Post hoc analyses indicated significant findings for Research Hypothesis 1.1.a. and 1.1.c (See Table 31). Tables 32 through 34 display the correlations between the variables, unstandardized regression coefficients (β) and intercept, the standardized regression coefficients (*b*), the squared semi-partial correlations (sr^2), R^2, and adjusted R^2. The *R* was significantly different for the Percent Change MSRI—Instructional Practice with Mentor Collaboration with Administration (see Table 32) and Percent Change MSRI—Instructional Practice with Mentor Collaboration with ACLs (see Table 33). This indicates the mentor supports: Collaboration with Administration and Collaboration with ACLs were individually predictive of percent changes in MSRI—Instructional Practice ratings.

The *R* was significantly different for Percent Change MSRI-Feedback and Mentor Collaboration with Alternative Certification Programs (see Table 34). This indicates that Mentor Collaboration with Alternative Certification Programs is predictive of Percent Change in MSRI-Feedback.

Table 31

Post Hoc Analyses Linear Regression F Statistics for Research Hypotheses 1.1.a and 1.1.c

Research Hypothesis		
1.1.a	Mentor supports accessed are significantly predictive of changes in the ECTs' ratings of their mentors using the MSRI-Instructional Practice.	
Univariate Mentor Supports		
	Administration	F (21,72) = 2.52, p = .004
	Academic Content Liaisons (ACLs)	F (21, 72) = 2.49, p = .004
Research Hypothesis		
1.1.c	Mentor supports accessed are significantly predictive of changes in the ECTs' ratings of their mentors using the MSRI-Feedback	
Univariate Mentor Support		
	Alternative Certification	F (21, 72) = 2.42, p = .005

Table 32

Post Hoc Analyses—Sequential Linear Regression Results Mentor Collaboration with Administration and MSRI- Instructional Practice Percent Change (1.1.a)

Variables	*β*	*b*	sr^2
Propensity Score	.96	.15	
School Index	.12	.04	
Mentor EOY—Certification	-.13	-.28	.03***
			p = .096
Mentor EOY—Number of Teachers	.02	.17	.
Mentor EOY—Pathway	-.00	-.01	
Mentor EOY—Number of Roles	.01	.03	
Mentor EOY—Same Content as Mentees	-.08	-.10	
Mentor EOY—Same Grade Level as Mentees	.14	.16	
Mentor EOY—Years as Mentor	.03	.10	
Mentor EOY—Years in Classroom	.21	.43	
Mentor EOY—Years in Elizabeth Schools	.05	.12	
Mobility	.00	.40	.08**
			p = .006
Percent of Non-Highly Qualified Teachers	.00	.13	
ECT EOY—Certification	-.02	-.03	
ECT EOY—Same Content Area as Mentor	-.14	-.15	
ECT EOY—Network	.02	.21	
ECT EOY—Role	-.02	-.02	
ECT EOY—Teaching Experience	.21	.33	.06**
			p = .019
ECT EOY—Years in Education	-.02	-.07	
Mentor Support Collaboration with Administration	.13	-.30	.04**
			p = .046
		Intercept = -.77	
		R^2 = .51[a]	
		Adjusted R^2 = .31	
		R = .71	

*$p < .10$

** $p < .05$

*** $p < .001$

[a]unique variability = .21; shared variability = .10

Table 33

Post Hoc Analyses—Sequential Linear Regression Results Mentor Collaboration with ACL and MSRI- Instructional Practice Percent Change (1.1.a)

Variables	β	b	sr^2
Propensity Score	1.49	.23	
School Index	-.03	-.00	
Mentor EOY—Certification	-.05	-.11	
Mentor EOY—Number of Teachers	.01	.12	.
Mentor EOY—Pathway	.01	.02	
Mentor EOY—Number of Roles	-.02	-.09	
Mentor EOY—Same Content as Mentees	.02	.03	
Mentor EOY—Same Grade Level as Mentees	.20	.22	
Mentor EOY—Years as Mentor	.05	.14	
Mentor EOY—Years in Classroom	-.03	-.07	
Mentor EOY—Years in Elizabeth Schools	-.03	-.07	
Mobility	.00	.48	.12***
			p = .001
Percent of Non-Highly Qualified Teachers	.00	.01	
ECT EOY—Certification	.03	.07	
ECT EOY—Same Content Area as Mentor	-.16	-.17	
ECT EOY—Network	.02	.19	
ECT EOY—Role	-.03	-.03	
ECT EOY—Teaching Experience	.20	.32	.05**
			p = .02
ECT EOY—Years in Education	.01	.02	
Mentor Support Collaboration with ACLs	-.10	.05	.04*
			p = .055
		Intercept = -.82	
		R^2 = .51[a]	
		Adjusted R^2 = .30	
		R = .71	

*p < .10

** p < .05

*** p < .001

[a]unique variability = .21; shared variability = .09

Table 34

Post Hoc Analyses—Sequential Linear Regression Results Alternative Certification and MSRI-Feedback Percent Change (1.1.c)

Variables	β	b	sr^2
Propensity Score	.78	.12	
School Index	.69	.23	
Mentor EOY—Certification	-.13	-.27	
Mentor EOY—Number of Teachers	.03	.29	.03*
			p = .077
Mentor EOY—Pathway	.03	.05	
Mentor EOY—Number of Roles	.01	.03	
Mentor EOY—Same Content as Mentees	-.11	-.13	
Mentor EOY—Same Grade Level as Mentees	.27	.30	.03*
			p = .085
Mentor EOY—Years as Mentor	.07	.07	
Mentor EOY—Years in Classroom	-.02	-.04	
Mentor EOY—Years in Elizabeth Schools	.02	.05	
Mobility	.00	.59	.18***
			p = .000
Percent of Non-Highly Qualified Teachers	.00	.06	
ECT EOY—Certification	-.04	.08	
ECT EOY—Same Content Area as Mentor	-.23	-.24	.04*
			p = .064
ECT EOY—Network	.01	.08	
ECT EOY—Role	-.03	-.03	
ECT EOY—Teaching Experience	.16	.24	.03*
			p = .077
ECT EOY—Years in Education	.01	.03	
Mentor Support Collaboration with Alternative Certification Program	.08	.25	.03*
			p = .096
		Intercept = .39	
		R^2 = .50[a]	
		Adjusted R^2 = .29	
		R = .71	

*p < .10

*** p < .001

[a]unique variability = .31; shared variability = -.02

Logistic regressions with univariate variables of mentor support and binary ECT outcomes of interest were performed using SPSS 20. The χ^2 statistics of complete models with propensity scores, control variables used in Research Questions 1 through 3, univariate mentor support variables and binary ECT outcomes of interest were examined. See Table 31 for means and standard deviations of univariate variables of mentor supports and binary ECT outcomes of interest. Post hoc analyses of binary ECT outcomes and univariate mentor supports indicated no significant findings when including propensity scores, and ECT, school, and mentor level variables in the logistic regression models.

Chapter 5: Discussion

This study had two main objectives:

1. Examine the relationship between receiving mentoring supports and mentor effectiveness to ECTs' outcomes including retention and Teacher Effectiveness Ratings.
2. Examine the relationship between mentor supports (i.e. release time, mentor training, and mentor professional development) on mentor activity and mentor effectiveness.

Through a pretest posttest quasi-experimental design, ECTs rated their mentors on the MSRI. Additionally, a composite variable of Supported vs. NonSupported mentor was calculated from self-reported survey data of the helpfulness and frequency with which mentors accessed mentor supports including: district mentors, mentor specific professional time, release time, video coaching, and collaboration opportunities with administrators and alternative certification programs. Propensity scores were created for ECTs using Supported versus. NonSupported mentors as a treatment variable. Analysis was conducted to determine if ECTs in the treatment condition (i.e. supported mentor) had significant differences in mentor effectiveness as measured by the MSRI, mentor activity as measured by the Mentor Work Log and ECT outcomes including self-reported retention plans after one and five years and percent changes in Teacher Effectiveness Ratings. This chapter presents major findings from the three overarching hypotheses and their sub hypotheses.

Major Findings

Research Question 1.0. The first research question in the study explored: Is there a difference in mentor effectiveness as measured by the Mentor Standard Rating Instrument for

school-based mentors by their ECTs depending on level of supportiveness (i.e. helpfulness and frequency of accessing Mentor PD, District Mentors, Collaboration, Release Time, etc.) experienced by mentors? There were no significant findings on mentor effectiveness as measured by the MSRI using propensity scores and the composite support variable. This indicated that there was no significant relationship between ECTs who have mentors who are Supported versus ECTs who have mentors who are NonSupported and ECTs' rating of mentor effectiveness using the MSRI.

Research Question 1.1. This question explored: Are mentor supports accessed (Mentor Academy, Mentor PD, Release time, District Mentors) predictive of changes in Mentor Standards Rating Instrument? Mentor supports accessed were not significantly predictive of changes in the MSRI. However, when building the sequential regression models controlling for teacher, mentor, and school characteristics, only one covariate was significant: mobility. Mobility of students within the school accounted for unique variability of .12 in the MSRI-Instructional Practice model; .14 in the MSRI-Planning model; .16 in the MSRI-Feedback model; and .19 in the MSRI-Composite model. None of the other covariates or predictor variables were significant. The student mobility covariate was a variable that was acquired from the state's rating system of schools (MSDE, 2015). Since mobility was the only covariate that was significant in this model, it is indicative that it is predictive of mentor effectiveness as measured by MSRI. It is possible that the student mobility captured more than just mobility but other unknown confounding variables such as school stability, stability of teaching staff, school environment. More exploration is needed to examine if the student mobility variable might also be a proxy for other variables and why those covariates might be predictive of percent change in MSRI ratings.

Research Question 1.1Post hoc analyses. Post hoc analyses of univariate mentor supports indicated that when controlling for propensity scores and covariates, Mentor Collaboration with Administration was significantly predictive of Percent Change in MSRI—Instructional Practice with a unique variability of .04. The unique variability of the model including the covariates was .21. These results indicate that 51% (31% adjusted) of the variance can be explained by knowing the value of Mentor Collaboration with Administration and covariate variables (see Table 33). Mentor Collaboration with ACLs was also significantly predictive of Percent Change in MSRI—Instructional Practice with a unique variability of .04. The unique variability of the model including the covariates was .21. These results indicated that 51% (30% adjusted) of the variance can be explained by knowing the values of Mentor Collaboration with ACLs and the significant covariates (see Table 34).

Although Mentor Collaboration with Administration and Mentor Collaboration with ACLs contributed a small part to the unique variance in their respective models, these findings are consistent with the intended roles and responsibilities of administration and ACLs. School-based administration as well as ACLs in Elizabeth Schools are encouraged to collaborate with mentors with curricula, content, and instructional strategies as they support ECTs. These are the types of competencies ECTs rated their mentors on the MSRI—Instructional Practice. Interestingly, however, Collaboration with Administration and Collaboration with ACLs were both negatively correlated with Percent Changes in MSRI—Instructional Practice (-.28 and -.14 respectively). Additional research is needed to further examine the negative relationship between Mentor Collaboration with Administration and Mentor Collaboration with ACLs and Percent Changes MSRI—Instructional Practice.

Additional post hoc analyses indicated that Mentor Collaboration with Alternative Certification Programs was a significant predictor of Percent Change in MSRI—Feedback when controlling for covariates and propensity scores. Mentor Collaboration with Alternative Certification Programs comprised .03 of the unique variability of the complete model. The unique variability of the total model including significant covariates was .31 (see Table 35). Fifty percent (29% adjusted) of the variance in Percent Change in MSRI—Feedback can be explained by Mentor Collaboration and other significant covariates. Since a high proportion of ECTs in Elizabeth Schools are from alternative certification programs such as TFA, UTC, and BCTR, mentors are encouraged to collaborate with coaches and supervisors from these programs. As part of the alternative certification process there is a strong emphasis on supervision, coaching, and feedback which may be related to the weak but positive correlation between Mentor Collaboration with Alternative Certification Programs and Percent Change in MSRI—Feedback (.03).

Research Question 2.0. This second question asked: Is there a difference in Mentor Work Log Activity (i.e. time in total minutes and frequency in total number of entries by their ECTs depending on level of supportiveness (i.e. helpfulness and frequency of accessing Mentor PD, District Mentors, Collaboration, Release Time, etc.) experienced by mentors? There were no significant relationships between Work Log Activity measured in time in minutes and number of entries and ECTs using propensity scores and the composite support variable. This indicates that there was no significant relationship between ECTs who have mentors who are Supported versus ECTs who have NonSupported mentors and Mentor Work Log Activity.

Research Question 2.1. This question asked: Are mentor supports accessed (Mentor Academy, Mentor PD, Release time, District Mentors) predictive of Mentor Work Log activity?

Mentor supports accessed were not significantly predictive of Work Log Activity nor were any of the covariates that controlled for teacher, mentor, and school characteristics that were included in the regression model. This indicates that the types of supports mentors access including: Mentor Professional Development, Release Time specific for mentoring, District Mentors, and Collaborative Opportunities) were not predictive of Work Log Activity

Research Question 3.0. The third research question asked: What is the relationship between school-based mentoring and Early Career Teacher Outcomes (i.e. self-reported retention, improved practice, and future career plans)? It was shown that there was no significant relationship between the MSRI and ECT career outcomes including: self-reported retention after one year, five years, and percent change in Teacher Effectiveness Rating. This suggests that there is no relationship between school-based mentoring and ECT outcomes. However, because only one measure, the MSRI was used it is important to not overgeneralize this finding.

Research Question 3.1. This research question asked: Is there a difference in Early Career Teacher Outcomes depending on the level of supportiveness (i.e. helpfulness and frequency of accessing Mentor PD, District Mentors, Collaboration, Release Time, etc.) experienced by mentors? A propensity score analysis with a composite variable for Supported versus NonSupported mentor was used to explore the relationship between supportiveness and ECT outcomes including: self-reported retention after one year, five years, and percent change in Teacher Effectiveness Rating. It was shown that there were no significant relationships between Supported versus NonSupported mentors and ECT outcomes: percent change and self-reported retention after five years. Due to an issue with data convergence the model would not run and it

cannot be determined if level of supportiveness has a significant relationship with the ECT outcome: self-reported retention after one year.

Research Question 3.2. This question explored: Are mentor supports accessed (Mentor Academy, Mentor PD, Release time, District Mentors) predictive of Early Career Teacher Outcomes? Mentor supports accessed were not significantly predictive of ECT outcomes nor were any of the covariates that controlled for teacher, mentor, and school characteristics that were included in the regression model. This indicates that the types of supports mentors access including: Mentor Professional Development, Release Time specific for mentoring, District Mentors, and Collaborative Opportunities) are not predictive of ECT outcomes. Due to an issue with data convergence the model would not run and it cannot be determined if mentor supports accessed were a significant predictor of the ECT outcome: self-reported retention after one year.

Research Question 3.3. This question asked: What is the relationship between Mentor Work Log Activity and Early Career Teacher Outcomes? Mentor Log Activity (time in minutes and number of entries) were not significantly predictive of the covariates that controlled for teacher, mentor, and school characteristics for one of the ECT outcomes: percent change in Teacher Effectiveness Rating. Due to an issue with data convergence the model would not run and it cannot be determined if Mentor Work Log Activity is a significant predictor of the ECT outcome: self-reported retention after one year. There was a significance of the model for the ECT outcome, self-reported retention after five years. However, none of the individual covariates or predictor variables were significant so it is not clear what caused the model significance. Consequently there is not enough information to conclude that Mentor Work Log Activity was predictive of self-reported retention after five years.

Research Question 3.4. This research question asked: What is the relationship between Mentor Type (full release mentor) and Early Career Teacher outcomes? The full-release status of a mentor was not significantly predictive of ECT outcomes when controlling for teacher, mentor, and school characteristics. None of the covariates were significant. This indicates that release status of mentor is not related to ECT outcomes.

Assimilation with Previous Research: Theoretical Findings

This study was framed by the literature reviewed in Chapter 2 and it will be reviewed below.

In an effort to support ECTs who are entering classrooms through traditional teacher preparation programs and alternative certification pathways there has been a continued focus on induction programs. This study focused on a specific component of induction programming: mentors. As the research has indicated too often induction and mentoring are combined in studies and their individual component effects are not teased out (Ingersoll & Smith (2004); Long, McKenzie-Robblee, Schaefer, et al., 2012). To this end, the purpose of the study was strictly mentoring. Furthermore, it also explored another aspect that is too rarely examined: the professional development of mentors.

Unfortunately mentoring programs make the assumption that knowing how to teach means knowing how to mentor (Feiman-Nemser & Carver, 2012)). Norman and Feiman-Nemser (2005) identified two types of mentoring: educative which is viewed as an inquiry process by which ECTs can develop their teaching through coaching, modeling, and feedback. In contrast, the limited type of mentoring focuses much more on the lower level day to day concerns of a teacher including basic classroom management, navigating school processes and procedures. It does not focus on building a teacher's practice. The Elizabeth School Mentoring Cycle of

Development (see Figure 3) is grounded in an educative approach to mentoring. The supports available to mentors including mentor academy, mentor specific professional development, district mentors, release time, and other opportunities for collaboration (see Figure 4) are meant to build the capacity of mentors to be more educative mentors. Likewise, the Mentor Standards (see Table 1) are designed with the Mentor Cycle of Development in mind and the Mentor Work Log is meant to be an interactive tool log of shared experience on the Cycle and where ECTs can identify needs the mentor can be responsive to. This is consistent with Hobson, Ashby, Maldarez, and Tomlinson's (2009) argument that mentor responsiveness and treating the ECT as an adult learner is essential for a mentor-mentee relationship to be effective.

No significant multivariate findings were found in this study. However, post hoc analyses indicated that further research is warranted for reasons which will be discussed more in the future research section of this chapter. In addition to the findings from the post hoc analyses it might be interesting to consider if the educative type of mentoring is the most effective or if for a first year teacher, limited is more useful and as the ECT becomes more sure-footed (in their second through third years) mentors should transition to a more educative approach. Furthermore, Achinstein and Athanses (2006) presented the idea that mentors who do not participate in professional development often revert to the 'reductive' type of mentoring which is more aligned with Norman and Feiman-Nemser' (2005) limited approach. This limited approach relies heavily on quick fixes and in the moment mentoring as opposed to the more reflective approach. It would be interesting to explore what type of mentoring practices (educative versus limited) mentors implemented depending on the type and frequency of professional development they receives.

Although this study did not have any initial major significant findings it builds on and expands the existing literature base. In 2011, Ingersoll and Strong completed a systematic review of studies that focused on induction supports including mentoring supports and their relationship to early career outcomes. Of the 500 they initially identified, only 15 ultimately met their criteria of being non-descriptive and having more than one outcome that was connected specifically to ECTs including retention, satisfaction, or student achievement. This study meets Ingersoll and Strong's(2011) criteria. It was empirical in nature and used the advanced quantitative methodology of propensity scores which reduces bias and can serve as a fairly good proxy of a randomized experiment (Rosenbaum, 2005). Even for those research studies Ingersoll and Strong selected, questions that used multivariate and logistic regression models teacher, mentor, and school characteristics were often not controlled for in their respective studies. The lack of appropriate controls was another critique of studies Ingersoll and Strong reviewed especially as an explanation for mixed results.

Ingersoll and Strong's second criteria for inclusion were that studies must include three outcomes that were specifically connected to ECTs. This study meets these criteria: two outcomes are retention (short-term and long-term) and one outcome is percent change in Teacher Effectiveness Rating by a qualified observer (i.e. their administrator). Of the 15 studies Ingersoll and Strong (2011) reviewed (see Table 2), eight indicated positive teacher outcomes. However none of these eight studies focused specifically on mentor only supports and these eight studies either did not have a comparison group and/or did not control for school, teacher, and mentor characteristics that could confound the findings. In short, the findings are questionable at best and more robust and carefully planned research is needed.

By adding more quantitative and quasi-experimental studies to the research base, such as this study, a more comprehensive understanding of the relationships between mentors and ECTs emerges and future studies can use this research base to refine experimental or programmatic designs or as a launching point for new and revolutionary ideas of mentoring.

Practical Applications

The findings from this study should influence the development and evaluation of mentoring programs for ECTs in schools and teachers. The practical applications outlined below can improve the quantity and quality of research on this topic with the ultimate goal of identifying the key components of a mentoring program that are related to ECTs' outcomes because in this age of limited resources, it is essential to be strategic with the resources you have.

1. *Development of valid mentor rating instrument.* Feiman-Nemser and Carver (2012) discussed the importance of providing professional development opportunities for mentors to not only provide them with appropriate skills and competencies but also to build a cadre of mentor teachers who can support teachers, assume leadership and responsibility in the school for supporting these teachers (Pajak & Carr, 2003) and feel rejuvenated in their own professional lives (Fletcher & Strong, 2009). However, all research that seeks to measure the effectiveness of mentors on a set of competencies or skills consists of "testimonials and opinions rather than findings based on scientific techniques" (Fletcher, Strong, & Villar, 2008, p. 2273). In fact, in developing the methods for this study no validated scale measuring mentor effectiveness on a set of skills or standards was available. As a result, one was developed in an effort to provide quantifiable data to examine the research questions.
2. *Clear demarcation between induction and mentoring for ECTs.* In order to clearly identify which supports are related to ECTs' outcomes it is essential to delineate between induction

supports and mentoring. Induction and mentoring are often used interchangeably and in many studies the individual effects of the supports are not easy to discern (Ingersoll & Smith, 2004; Long, McKenzie-Robblee, Schaefer, et al., 2012). The purpose of this study was strictly mentoring. No other induction supports were examined for this study in an effort to not "muddy the waters." Fortunately, in Elizabeth Schools when this study was undertaken there was a Mentoring Coordinator separate from the Coordinator of New Teacher Support. The two coordinators collaborated but the goals of their work had different foci.

3. *Comprehensive professional development program for mentors.* As previously mentioned this study was undertaken during a time when the federal government awarded a large grant to Elizabeth Schools to support induction and mentoring programs. As a result there was an office devoted to mentoring which had the resources in staff and materials to provide targeted professional development through district mentors and mentor specific professional development in addition to other more school-based decisions such as release time or mentor based decisions such as collaboration with partners. Due to this structure it was clear what supports were available to mentors. If another study of mentor professional development will be undertaken it is important to know what supports are available to mentors and that they are universally available to all mentors across the district.

Limitations

Limitations are the "systematic bias that the researcher did not or could not control and which could inappropriately affect the results" (Price & Murnan, 2004, p. 66)

Study design. This quasi-experimental observation study was limited by its design. Due to the nature of social science it was not feasible to do a true randomized experiment which would lead to unbiased results because it does not meet all three of Rosenbaum's key rules: the

treatment is beneficial and not harmful; it is unclear what the best treatment is; and "the investigator can control the assignment and delivery of treatments" (2005a, p. 1). Specifically the investigator cannot control the assignment and delivery of treatment for practical, political, and ethical reason. Propensity score analysis and inclusion of covariates were included in modeling to address some of this bias.

Impact. The setting for this study and subsequently the sample is Elizabeth City Schools is an urban school district in a mid-sized Mid Atlantic City. The district's student population is predominantly African American. There is a high percentage of Title I schools and teachers with less than three years teaching experience from alternative certification programs. Furthermore, this study took place during the 2013-2014 school year, a time period during which the district received a large grant from the federal government, Race to the Top, to fund induction programs. This included funding a comprehensive Mentor Academy, three District Mentors, and cameras for a video coaching project in partnership with a local university. These factors of setting, sample, and unique resources limit the generalizability of this study's findings beyond that of this sample and study's context.

Data. A new instrument called the Mentor Standard Rating Instrument (MSRI) was developed, piloted and tested for validity and reliability by the investigator for the study. It was piloted on a sample of similar teachers and mentors that participated in the actual study. No construct validity testing was undertaken to determine how the MSRI related to other mentor standards and the investigator could find no other instrument similar to the one that was developed. As a result, the quality of the psychometric properties of this instrument is undetermined. Additionally, it was difficult to triangulate outcomes such as the early career outcomes, Mentor Work Log, and MSRI ratings. These data points were self-reported and

collected through survey data. Consequently, they data may be inflated, underestimated, or lack precision.

Secondly, sample size in this study was small (n = 73) compared with the universe of ECTs in Elizabeth Schools (N = 1,300). Likewise, the mentor sample small was (n = 35) compared with the universe of mentors (N = 200) in Elizabeth Schools. This was due to convenience sampling and participants self-selected to participate in the study. There were no incentives or mandates requiring participation. Consequently, the results are generalizable only for the sample who participants and not the universe of ECTs and mentors in Elizabeth Schools.

Future Research

The methodology and findings from this current study have implications for future research in examining the relationship of Supported versus NonSupported mentors on mentor effectiveness and ECT outcomes. The current research base while providing a foundation is not without its problems: there are mixed findings which may be the result of studies with small sample sizes, no controls, lack of valid instruments, and which do not delineate between induction supports generally and mentoring more specifically. Below are suggestions for future research based on the current study.

Although this study did not have any significant multivariate findings, I believe there is merit in and evidence to support the notion that mentors have a positive effect on their mentees' retention (Smith & Ingersoll, 2004) and that mentors need to be supported to do this work. Post hoc analyses were conducted which focused on discrete mentor supports that had been previously combined to form composite variables for mentor collaboration. Analyses of these univariate mentor supports in the logistic models for research questions 1 through 3 indicated significant findings for 1.1.a and 1.1.c. Collaboration with Administration and Collaboration

with ACLs individually were predictive of Percent Change in MSRI—Instructional Practice in the complete model, albeit it negatively and to a minimal degree. In addition, Collaboration with Alternative Certification Programs was predictive of Percent Change in MSRI—Feedback in the complete model to a minimal degree. Although the findings from the post hoc analyses are modest they suggest that additional analysis is warranted that examines the discrete types of supports that mentors access to delineate what is related to mentor efficacy and mentor professional development because too often mentor supports are conflated (Smith & Ingersoll).

In a separate study, mentors indicated that the largest barriers they faced in addition to time were limited guidance and lack of training (Stock & Duncan, 2010). Figure 8 outlines this theory of action. This study's investigatory goals align with this theory of action. However, this study had limitations that may have affected its ability to identify significant differences if any existed. As discussed in the limitations sections, this study had a small sample size with a limited number of teacher mentor pairs (n = 73). This sample of mentor-mentee pairs represented 35 unique mentors. This is 17.5% of the total mentor population (N = 200). Additionally, the majority of the data except for the Teacher Effectiveness Rating which was supplied by the district was self-report.

An examination of the composite support variable that was used to calculate the propensity scores indicated that the majority of mentors felt supported. As a result the treatment group was much larger than the control group which led to an imbalance so while the propensity score improved the balance and standard variance somewhat, it was minimal. In addition, although teacher, mentor, and school characteristics were used as controls in the analyses, future analysis might benefit from building models within hierarchical linear modeling (HLM) (Raudenbush & Bryk, 2002) with teachers nested within mentors nested within schools. This

would have also helped with the variation. However, HLM will have the same problem as the propensity score analysis unless the sample size is increased. A future study would need to have a purposeful plan for increasing sample size or developing a sampling process which will afford the investigator a smaller sample size to follow up with and incentivize.

As mentioned previously, the mentoring supports available in Elizabeth Schools during the 2013-2014 school year were a unique situation due to stimulus spending. Those supports are not typical and unfortunately not sustainable. As a result, a future study would have to focus on the support or supports that are currently available to the mentors. By focusing on a specific support such as Mentor Academy more emphasis can be placed on tracking participation and dosage. Furthermore, if a significant relationship is found it can be more easily attributed to the Mentor Academy than supports more generally.

Figure 8.. Study Theory of Action

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Curriculum Vitae

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Johns Hopkins University	Certificate	2015	Administration & Supervision
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Johns Hopkins University	M.A.T.	2004	Elementary Education
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EXPERIENCE

9/13- present	Educational Specialist- Assessments & SLOs and Gifted & Advanced Learning
7/11-9/13	Program Evaluator for Baltimore City Public Schools
9/10-1/13	Faculty Associate and Graduate Advisor for Johns Hopkins University School of Education
6/10-7/11	Program Evaluator Consultant for National Summer Learning Association
9/08-8/11	Research Consultant for JHU School of Education and Baltimore Education Research Consortium (BERC)
9/08-5/10	Court Monitor Consultant for U.S. District Court
9/08-7/11	Graduate Assistant and Institute of Education Sciences trainee grant fellow in the School of Education, Johns Hopkins University
9/08-5/10	Curriculum Development, Anne Arundel County Public Schools

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7/04-7/08	General Educator, Anne Arundel County Schools
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CERTIFICATE

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PEER REVIEWED PUBLICATIONS

Cuddapah, J.L., Beatty-O'Ferral, M.E., Masci, F.J., Hetrick, M. (2011). New Educator, 7(2), 114-130.

Hudock, M. (2009). A Review of: "Latino dropouts in rural America: Realities and possibilities. Carolyn Hondo, Mary E. Gardiner, and Yolanda Sapien.". *Journal of Education for Students Placed at Risk, 14*(3), 275-279.

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AWARDS

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